Erler & Kalinowski, Inc.

TRACY

City of Tracy

2010 Urban Water Management Plan

May 2011

Consulting engineers and scientists

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LIST OF ABBREVIATIONS AND ACRONYMS

AB3030	Assembly Bill 3030, Groundwater Management Act
AB 303	Assembly Bill 303, Local Groundwater Assistance
AB 1420	Assembly Bill 1420, Water Demand Management Measures
ac-ft	acre-feet
Act	Urban Water Management Planning Act
ADWF	Average Dry Weather Flow
ASR	Aquifer Storage and Recovery
BBID	Byron-Bethany Irrigation District
BCID	Banta-Carbona Irrigation District
BMO	Basin Management Objectives
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
CII	Commercial, Industrial, and Institutional
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CVRWQCB	Central Valley Regional Water Quality Control Board
DAF	Dissolved air flotation
DEIR	Draft Environmental Impact Report
DGWTP	Nick C. DeGroot Water Treatment Plant
DMC	Delta-Mendota Canal
DMM	Demand Management Measures
DPWD	Del Puerto Water District
DWR	State of California Department of Water Resources
EC	specific conductance, measured by electrical conductivity
EIR	Environmental Impact Report
EKI	Erler & Kalinowski, Inc.
ft bgs	feet below ground surface
ft msl	feet above Mean Sea Level
FY	Fiscal year
GEI	GEI Consultants, Inc., Bookman-Edmonston Division
GMO	Growth Management Ordinance
GMP	Groundwater Management Plan
GPM	Gallons per minute
GPS	Global Positioning System
ISP	Industrial Specific Plan
JJWTP	John Jones Water Treatment Plant
LAFCO	Local Agency Formation Commission
M&I	municipal and industrial
MCL	maximum contaminant level

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LIST OF ABBREVIATIONS AND ACRONYMS (Continued)

MG	million gallons
mg/L	milligrams per liter
MGD	million gallons per day
NPDES	National Pollutant Discharge Elimination System
PG&E	Pacific Gas & Electric
PROSIM	Project Simulation Model
PUD	Planned Unit Developments
PVWD	Plain View Water District
PWD	Patterson Water District
RGA	Residential Growth Allotment
RMF	Residential multifamily
RRA	Reclamation Reform Act of 1982
RSF	Residential single family
SB	Senate Bill
SB 7	Senate Bill 7
SCWSP	South County Water Supply Project
SEMS	Standardized Emergency Management System
SJCFCID	San Joaquin County Flood Control and Irrigation District
SLDMWA	San Luis & Delta-Mendota Water Authority
SOI	Sphere of Influence
SSJID	South San Joaquin Irrigation District
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
THM	trihalomethanes
TMC	City of Tracy Municipal Code
Tracy	City of Tracy
UAW	Unaccounted-for water
ULFT	Ultra-Low-Flush Toilets
USBR	United States Bureau of Reclamation
UWMP Act	Urban Water Management Planning Act
UWMP	Urban Water Management Plan
WCC	Water Conservation Coordinator
WCRP	Water Conservation and Rationing Plan
WEP	Water Exchange Program
West SID	West Stanislaus Irrigation District
WSCP	Water Shortage Contingency Plan
WSERP	Water System Emergency Response Plan
WSID	West Side Irrigation District
WUDS	Water Usage Data System
WWTP	Wastewater Treatment Plant

1. INTRODUCTION

In 1983, California enacted the Urban Water Management Planning Act ("UWMP Act") (Water Code Sections 10610 - 10656). The UWMP Act states that every urban water supplier that provides water to 3,000 or more customers, or that provides over 3,000 acre-feet of water annually, should ensure water service reliability to meet the needs of its customers during normal, dry, and multiple-dry years. Normally, the UWMP Act requires urban water suppliers to update their Urban Water Management Plan ("UWMP") for submittal to the Department of Water Resources ("DWR") in years ending in five and zero. However, because of recent changes in UWMP requirements, State law has extended the deadline for the 2010 plans to 1 July 2011. In accordance with the UWMP Act, Erler & Kalinowski, Inc ("EKI") has, on behalf of the City of Tracy ("City" or "Tracy"), prepared this 2011 update to the Tracy Urban Water Management Plan.

Tracy's 2011 UWMP describes how the City intends to manage its existing and future water resources and demands to continue to provide its customers with an adequate and reliable water supply. This updated UWMP reflects changes to the City's water supply portfolio and water uses, as well as the following significant revisions that have been made to the UWMP Act since 2005. The most recent version of the UWMP Act is included for reference as Appendix A.

- Pursuant to AB 1420, Laird, 2007: Eligibility for water management grants and loans from DWR, the State Water Resources Control Board, and the California Bay-Delta Authority, will be conditioned on the implementation of all locally cost-effective Demand Management Measures ("DMMs") described in the UWMP Act. The UWMP Act contains 14 DMMs, including, among other things, residential water surveys, plumbing retrofits, landscape conservation, and commercial conservation programs. DWR has published guidelines to assist water agencies in meeting the requirements of AB 1420. As part of these guidelines, DWR requires the implementation of DMMs at the coverage level determined for Best Management Practices ("BMPs") by the California Urban Water Conservation Council ("CUWCC") in the "MOU Regarding Urban Water Conservation in California," dated December 10, 2008, and as amended.
- Pursuant to SB 1087, Florez, 2005: Water demand projections reported in a UWMP must identify the projected water demand for lower income single-family and multi-family residential households. The intent of this legislation is to assist water suppliers in complying with Government Code 65589.7, which grants priority for the provision of service to housing units that are affordable for lower income households.
- Pursuant to SB 7, Steinberg, 2009: SB 7 requires the state to reduce urban per capita water demand by 20 percent no later than 31 December 2020, and by at least 10 percent no later than 31 December 2015. The legislation recognizes that it may be possible to achieve the per capita water demand reductions while maintaining or even increasing overall water demand, depending on changes in climate and population within each supplier's service area.

  SB 7 identifies the UWMP as the primary mechanism for reporting water demand estimates and water demand targets required by SB 7. UWMPs must also include the following:

- A water efficiency component that includes programs for implementing best management practices, climate-appropriate landscaping, and accelerated water metering;
- A local water resources component that considers water quality and alternative local supply sources;
- A water efficiency planning component that estimates the conservation savings to be achieved through the development of local supplies, residential water efficiency, and commercial, industrial, and institutional water efficiency; and
- Interim milestones for assessing progress toward meeting these conservation targets.

Tracy has prepared this UWMP in accordance with the format suggested in the DWR's *Guidebook to Assist Water Suppliers in the Preparation of a 2010 Urban Water Management Plan,* dated March 2011. In each of the following sections, this document repeats the relevant paragraph of the UWMP Act, followed by information pertinent to existing and projected conditions for the City of Tracy. Supporting documentation is provided in Appendices A through P. Other sources for the information contained herein are provided in the References section of this document.

1.1 AGENCY COORDINATION

10620 (d) (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

Tracy derives most of its water supply from multiple surface water sources through contracts with the federal government, and surrounding irrigation and water districts. The remainder of Tracy's water supply comes from groundwater extracted from the local Tracy Groundwater Basin, management of which is coordinated by multiple overlying and appropriative groundwater users.

Tracy coordinates water supply and management efforts with the following agencies, grouped according to common water supply source:

- *Delta-Mendota Canal /Central Valley Project ("DMC/CVP") Water*
  - U.S. Bureau of Reclamation ("USBR") - San Luis & Delta-Mendota Water Authority ("SLDMWA")
  - Banta-Carbona Irrigation District ("BCID")
  - West Side Irrigation District ("WSID")
  - Byron-Bethany Irrigation District ("BBID")
- *South County Water Supply Project ("SCWSP")*
  - South San Joaquin Irrigation District ("SSJID")
  - City of Manteca
  - City of Lathrop
  - City of Escalon
- *Tracy Basin Assembly Bill 3030 ("AB 3030") Regional Groundwater Management Plan*
  - Plain View Water District ("PVWD"), which is now part of BBID;
  - BCID

- Del Puerto Water District ("DPWD")
- Patterson Water District ("PWD")
- WSID
- West Stanislaus Irrigation District ("West SID")
- San Luis & Delta-Mendota Water Authority
- San Joaquin County Flood Control and Irrigation District ("SJCFCID")

- *Semitropic Water Bank*

Tracy entered into a 40-year Municipal and Industrial ("M&I") contract with the USBR (Contract No. 14-06-200-7858A, or the "Tracy Contract") in 1974 for an annual entitlement of 10,000 acre-feet ("ac-ft") of surface water from the Central Valley Project ("CVP") via the Delta-Mendota Canal ("DMC") (conjunctively referred to as the "DMC/CVP") (Kennedy/Jenks, 1994). Tracy has the right of renewal for the Tracy Contract. Tracy is working to renew the Tracy Contract with the USBR prior to the Tracy Contract's 2014 expiration date. If the renewed Tracy Contract is not completed before 2014 the City has a right for an interim contract.

On 27 February 2004, Tracy, the USBR, and the Banta-Carbona Irrigation District entered into an agreement for an assignment of 5,000 ac-ft of Agricultural reliability ("Ag-reliability") water from the BCID to Tracy (Contract No. 14-06-200-4305A or "BCID Contract").[1] Also on 27 February 2004, Tracy, the USBR, and the West Side Irrigation District entered into an agreement for an assignment of 2,500 acre-feet of Ag-reliability water from the WSID to Tracy (Contract No. 7-07-20-W0045-B "WSID Contract').[2] Tracy also has the option to exercise the right to a future assignment of an additional 2,500 acre-feet of Ag-reliability water now under WSID's existing contract with USBR. These WSID and BBID CVP contracts with USBR have a 40-year term and will expire in 2044. As part of the Tracy Contract negotiations, the USBR is considering combining its three separate contracts with Tracy into a single contract, with a likely term of 40 years.

Tracy is involved in a collaborative effort with the Cities of Manteca, Escalon, and Lathrop and with the SSJID for the operation of the SCWSP. As part of the SCWSP, Tracy has been allocated 10,000 ac-ft per year of Stanislaus River water and 15 million gallons per day ("MGD") of treatment capacity in the Nick C. DeGroot Water Treatment Plant ("DGWTP"). Tracy began receiving deliveries of Stanislaus River water in August 2005. Tracy's coordination efforts with the entities involved in the SCWSP include coordinating schedules of water deliveries.

Tracy also coordinates with several other agencies in the DMC/CVP Service Area (i.e., Byron-Bethany Irrigation District, Banta-Carbona Irrigation District, Del Puerto Water District, Patterson Water District, West Side Irrigation District, West Stanislaus Irrigation District, San Luis & Delta-Mendota Water Authority, and the San Joaquin County Flood Control and Irrigation District) in the management of the Tracy Groundwater Basin ("Basin"). These Basin stakeholders collectively developed a Regional Ground Water Management Plan ("Regional GMP") for the Basin pursuant to the 1992 Groundwater Management Act, AB 3030.[3] The stated objective of the

[1] http://www.usbr.gov/mp/cvpia/3404c/lt_contracts/2004-05_foc/2004foc_banta_carbona_id_09-24-04.pdf

[2] http://www.usbr.gov/mp/cvpia/3404c/env_docs/final_ea_fonsi/dmc/dmc_ea_chap03-01_feb2005.pdf

[3] Provisions to AB 3030 have been added since its original passage in 1992. For example, the Machado Amendment (SB 1938) added specific requirements regarding what must be included in a GMP for an entity to be eligible for state

GMP is to manage the Basin such that sustained use of groundwater can be optimized without adverse impacts to water quality and yield. Tracy adopted the Regional GMP via Ordinance No. 511 on 21 May 1996. Tracy is participating in the updating of this plan.

Tracy coordinates with the San Joaquin Local Agency Formation Commission ("LAFCO") regarding the water service area boundary.

A summary of the UWMP coordination process between Tracy and relevant agencies is provided in Table 1 and the notification process is described in Section 1.2.1.

1.2 NOTIFICATION OF UWMP PREPARATION

Tracy began preparation of this updated UWMP in November 2010 and has encouraged stakeholder interaction throughout the process. A description of the notifications that Tracy has sent to the agencies and the public that the City coordinates with is provided below.

1.2.1 Agency Notification

On 6 January 2011, the City sent a letter to agencies identified below to inform them that the City was in the process of updating its UWMP and was soliciting their input.

- City of Lathrop
- City of Manteca
- Mountain House Community Services District
- Banta-Carbona Irrigation District
- Byron-Bethany Irrigation District
- Westside Irrigation District
- San Joaquin County of Public Works
- Pescadero Reclamation District
- South Delta Water Agency
- San Luis and Delta Water Authority
- South San Joaquin Irrigation District

On 22 February 2011, the City sent a letter to each of the above mentioned agencies informing them where the document would be available for review and welcoming their input and comments on the document. The draft 2011 UWMP was available for public review at the Tracy Public Library, the Tracy Public Works Department, and the City Clerk's Office. The letter also informed the agencies that the SB 7 and UWMP public hearing would be occurring at City Hall on 17 May 2011. The letter was sent more than 60 days before the public hearing as required by code.

A sample copy of a notification letter is included in Appendix B.

funds administered by the Department of Water Resources for the construction of groundwater projects or groundwater quality projects.

1.2.2 Public Notification

Tracy notified the public and solicited the public's input throughout the 2011 UWMP preparation process. Two notifications were published including an invitation to participate in the UWMP planning and a notification of the public hearing. A sample version of each of the public notifications described below is provided in Appendix B.

During the preparation of its UWMP, on 25 January 2011, the City published a notice in the Tri Valley Herald informing the public that the City was in the process of updating its UWMP and soliciting their input during the update process.

Consistent with Government Code 6066,[4] on 28 February 2011 and 7 March 2011, Tracy published a notice in the Tri Valley Herald informing the public that the 2011 UWMP would be available for public review at the Tracy Public Library, the Tracy Public Works Department, and the City Clerk's Office. The notice also informed the public that the SB 7 and 2011 UWMP public hearing would be held at Tracy City Hall on 17 May 2011.

The public review draft of the UWMP was posted on the City's website on 18 April 2011[5]. On the website, the public was encouraged to send comments on the draft UWMP to the City. The availability of the draft UWMP on the City's website was also posted both on the City's twitter account[6] and the City's Facebook account[7], on 18 April 2011.

1.3 WATER MANAGEMENT TOOLS

10620 (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

As described above and in Section 4, Tracy conjunctively uses its surface water and groundwater resources to meet its water demands and to increase the redundancy and reliability of its water supply. Tracy has been proactive in securing surface water rights, while relying on groundwater for peaking during the summer and for supplemental drought supplies. Tracy is pursuing increased management of its groundwater supplies through development of a pilot Aquifer Storage and Recovery ("ASR") program.

Additionally, Tracy is purchasing water storage space in the Semitropic Water Bank; this increases the City's water supply reliability during drought conditions. Tracy is also developing agreements with the Byron-Bethany Irrigation District for acquisition of (1) the right to delivery of 3,000 ac-ft per year of water to which BBID is entitled based upon its pre-1914 appropriative water rights, and (2) the option to acquire BBID CVP contract rights to up to approximately 11,000 Ag-

[4] Government Code Section 6066. Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.

[5] http://www.ci.tracy.ca.us/, accessed on 18 April 2011.

[6] http://twitter.com/#!/cityoftracy, accessed on 18 April 2011.

[7] http://www.facebook.com/cityoftracy#!/cityoftracy?sk=wall, accessed on 18 April 2011.

reliability DMC/CVP water. Tracy is also planning on acquiring an additional 3,000 ac-ft from SSJID as part of the SCWSP.

Tracy is managing its water resources with the goal of mitigating the need to import water through water conservation efforts and planned use of recycled water to offset potable water demand for irrigation purposes within the City. Additional information related to these water management efforts is provided in Sections 4 and 6.

1.4 ADOPTION AND IMPLEMENTATION OF UWMP

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code.. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

As described in Section 1.2, the City informed the public and the appropriate agencies of (1) its intent to prepare this updated 2011 UWMP, (2) when and where the UWMP was available for public review, and (3) when the public hearing regarding SB 7 and the UWMP would be held. All notifications were completed in compliance with Section 6066 of the Government Code.

This updated 2011 UWMP was adopted by Resolution No. 2011-099 by the City Council during its 17 May 2011 City Council meeting. A copy of the resolution is included in Appendix C.

A copy of the adopted 2011 UWMP including any amendments will be provided to DWR, the California State Library, San Joaquin County, USBR, SSJID within 30 days of the adoption. A copy of the adopted 2011 UWMP will be available for public review during normal business hours within 30 days after filing the plan with DWR.

The plan will be implemented as described in the following sections.

2. SERVICE AREA INFORMATION

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following: (a) Describe the service area of the supplier; including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

Tracy is located in San Joaquin County, 68 miles south of Sacramento and 60 miles east of San Francisco (Figure 1). The City lies east of the Coastal Range that separates California's Central Valley from the San Francisco Bay Area. Interstate 205 runs through the northern-most part of the City and connects I-580 to I-5, a major north-south interstate corridor east of Tracy.

Included below is information provided in Tracy's 2009 General Plan related to the City's development, population, and demographic projections. In addition, this section describes local climate and geography.

2.1 CITY LIMITS AND SPHERE OF INFLUENCE INFORMATION

The existing incorporated area of the City encompasses approximately 22 square miles (General Plan, 2009). The Sphere of Influence ("SOI") is the area outside of the City limits that Tracy expects to annex and urbanize in the future, including the expected physical limit of the City based on the most current available information (Figure 2) (General Plan, 2009). During the Tracy General Plan update process, revisions to the SOI were made to more accurately reflect locations where Tracy may grow in the future and locations where no urban growth is expected.[8] The revised SOI is approximately 41 square miles, or 19 square miles larger than the City limits.

2.2 SPECIFIC PLANS AND LARGE PLANNED UNIT DEVELOPMENTS

Tracy's proximity to the San Francisco Bay Area and Silicon Valley has made it an attractive place for home buyers who want to live in a place with "small town" atmosphere and affordable housing, while maintaining access to the fast-growing Bay Area economy. Numerous Specific Plans and large-scale Planned Unit Developments ("PUDs") have been adopted within the Tracy City limits and SOI to accommodate growth demands. Descriptions of each plan or development and its geographic area and adopted uses are outlined below. The location of each plan area is shown in Figure 3.

- *Residential Areas Specific Plan*. Created in 1987, the Plan guides the development of 1,480 acres within the City limits. The land is grouped into three planning areas or neighborhoods, two on the southern side of the City and one in the northwest. These areas are largely built-out.
- *Plan C*. Formed in 1998, Plan C represents an infrastructure financing area comprised of approximately 1,417 acres located in the west, south and southeast portions of the City. Plan C is comprised of several separate PUDs that are designed to guide the development of

[8] The revised 2009 SOI is approximately eight square miles smaller than the previous SOI.

single-family homes with accompanying parks and schools. Plan C is largely built-out; however, there are several vacant parcels zoned for multifamily housing and commercial development.

- *I-205 Corridor Specific Plan*. The I-205 Corridor Specific Plan includes approximately 714 acres of land on the northwest and northeast sides of Tracy, adjacent to I-205. The Specific Plan includes development of shopping centers, auto plazas, and light industrial uses. The Plan also includes approximately 200 acres of residential development, including 216 high-density units and 733 medium and low-density units.
- *Northeast Industrial PUD*. Anticipated land uses on the 870-acre PUD in the northeast corner of the City include a mixture of manufacturing, warehousing, and distribution uses including rail-dependent industries and "flex-tech" light industrial.
- *Industrial Areas Specific Plan ("ISP")*. The ISP covers approximately 685 acres of land, mostly in the northeast quadrant of the South Tracy Boulevard-Linne Road intersection and the northeast quadrant of the MacArthur Drive-Eleventh Street intersection. This ISP area is designated for general, light industrial, office, and "flex-tech" uses. The Edgewood Corporate Center and South Tracy Business Park, which cater to small- to medium-sized companies, have already been developed in the ISP area.
- *South Schulte Specific Plan*. Approved in 1998, the South Schulte Specific Plan covers 1,844 acres located outside of the City limit on the southwest side of the City, northwest of the Airport. Approximately 1,090 acres of the South Schulte Specific Plan area is designated for residential uses and will accommodate a maximum of 5,700 dwelling units. An area of approximately 423 acres is zoned for industrial and commercial uses, 173 acres is designated for schools, parks and public facilities, and the remaining 157 acres is allocated for roads. Tracy is evaluating revisions to the South Schulte Specific Plan.
- *Gateway PUD*. The 538-acre Tracy Gateway project is located at the western edge of the incorporated City boundary, south of I-205 at the Eleventh Street off-ramp. The proposed development consists of 5.8 million square feet of office, commercial, and retail uses that support the Tracy community and an anticipated 20,000-person business population. The proposed project also includes a multi-story hotel and a golf course.
- *Tracy Hills Specific Plan*. The Tracy Hills Specific Plan area, located on the southwest side of the City, includes 6,175 acres. Of the 2,700 acres within the City limits, proposed land uses include approximately 1,300 acres at a mixture of densities with a maximum of 5,499 residential units. Approximately 600 acres with up to six million square feet of space are planned for commercial, office and industrial uses. Roughly half of the remaining 800 acres of the Specific Plan area within the City limits is designated to accommodate neighborhood parks, schools, recreational uses and other open space, while the other half is devoted to roads and canals. The remainder of the Specific Plan area (approximately 3,550 acres), located outside the City limits and within the SOI, is planned to remain permanent open space for habitat conservation and managed grazing.
- *Cordes Ranch*. Cordes Ranch has been added to the SOI, is referred to as Urban Reserve 6 and is 1,730 acres in size. The majority of the property is designated for industrial uses. The vision for the area is that the industrial uses would occupy the interior portions of the property, while the properties abutting Mountain House Parkway and I-205 would consist of

higher identity businesses with an emphasis on commercial, low-rise office and office/flex uses.

2.3 POPULATION OF TRACY'S SERVICE AREA

Population growth has been rapid in Tracy, with the City growing by 143% between 1988 and 2008. The State Department of Finance population estimate for Tracy as of January 1, 2010 was 82,107 (California, 2010). Tracy also serves water to the 377 residents in the Larch Clover County Services District outside of City Limits. The Larch Clover County Services District population is calculated by multiplying 3.279 people per household for Tracy from the Department of Finance for Tracy (California, 2008) by 115 residences[9]. The population served by Tracy is calculated by adding the population within the City Limits from the California Department of Finance (California, 2007; California, 2010) and the population within the Larch Clover County Services District as calculated above.

Tracy's future population growth, at least in the near-term, is not anticipated to be as rapid as it has been historically. Tracy adopted a residential Growth Management Ordinance ("GMO") in 1987, which was amended in 2000 by the voter-initiated Measure A. The objective of the GMO and Measure A is to achieve a steady and orderly growth rate that allows for the adequate provision of services and community facilities, and includes a balance of housing opportunities. Under the GMO, builders must obtain a Residential Growth Allotment ("RGA") to secure a residential building permit. The GMO limits the number of RGAs and building permits to an average of 600 housing units per year for market rate housing, with a maximum of 750 units in any single year, although there are exceptions for affordable housing (General Plan, 2009).

The projected population for 2010 through 2025 will be based on the General Plan (General Plan, 2009) and for 2025 through 2035 from the Draft Water System Master Plan (WYA, 2011). The population projections in this document are conservative for the following reason. The assumed increase in population may be higher than what will be observed because of the Measure A restriction. Table 2 lists Tracy's projected population in five-year increments to the year 2035. Tracy is projected to have a total future population of approximately 109,000 people by the year 2025 (General Plan, 2009). The population increase from 2010 through 2025 is assumed to be a linear projection based on the 2025 population listed in the 2009 General Plan. A 2040 population of 134,477 is listed in the draft Water System Master Plan (WYA, 2011). A linear growth rate is assumed from 2025 through 2040.

2.4 DEMOGRAPHICS

Except as noted, the following demographic information was taken from the Tracy website:[10]

- Median age of residents is 31.3 years;
- Median annual household income is $74,773; and
- 72% of housing units are owner-occupied and 28% are renter-occupied.

[9] Number of residences is provided by the City Finance Department.
[10] http://www.ci.tracy.ca.us/about/demographics/ accessed 10 November 2010.

2.5 GEOGRAPHY

Tracy, which lies along the western border of the San Joaquin Valley, has annexed a portion of the neighboring foothills (see Figure 1). Ground surface elevations in Tracy range from 600 feet above mean sea level ("ft msl") in the foothills along the southwestern boundary of the Tracy SOI to 9 ft msl at the northern boundary (Kennedy/Jenks, 1994). Tracy lies adjacent to the State Water Project's California Aqueduct, the DMC/CVP, and the Old River. The Old River flows east to west just north of Tracy.

2.6 CLIMATE

Spring, summer, and fall are generally hot in Tracy, with temperatures often climbing to over 100° Fahrenheit ("F") on summer days. Tracy's winters are usually mild, although the dense "Tule fog" can last for weeks. Mean winter temperatures range from 40 °F to 50 °F. Most precipitation occurs during winter. The average annual precipitation during the years 1949 to 2010 is recorded by the Western Regional Climate Center as 9.86 inches.[11]

2.7 WATER UTILITY SERVICE AREA AND INFRASTRUCTURE

Tracy serves water within a 44 square-mile area that includes the City limits and portions of the SOI. The extent of the water system service area and infrastructure are shown Figure 4. A small volume of BBID water that is managed through Tracy's treatment and distribution system on behalf of Patterson Pass Business Park is not considered to be part of Tracy's system and therefore is not included in the UWMP (see also Section 4.1.1.1). Details of the potable water supply system are provided below.

2.7.1 Service Connections

Tracy provides water service to all water users within the City Limits, plus approximately 377 residents of the Larch-Clover County Services District. All connections are metered. As of 1 December 2010, Tracy served 23,449 metered service connections. The distribution of the connections by customer sector are listed in Table 3. The majority of the connections are single-family residential.

2.7.2 Pressure Zones

Due to the several hundred foot difference in elevation throughout its service area, Tracy has established three pressure zones for its treated water distribution system. Figure 4 shows the area encompassed by the three existing pressure zones (Zones 1, 2, and 3), as well as the water distribution infrastructure and groundwater well locations. To support the development proposed in the foothills, two additional pressure zones (Zones 4 and 5) have been proposed for future use.

The three existing pressure zones include over 260 miles of water mains that vary in diameter up to 36 inches. The age of the pipes also varies, dating from about 1910 to the present. The three existing pressure zones are interconnected by pressure reducing valves, pressure sustaining valves, and a number of normally-closed interconnection valves (WYA, 2011). Several booster pump

[11] Western Regional Climate Center, Tracy Carbona station from 1949 to 2010.

stations regulate the pressure differences between the three existing zones and, along with the pressure control valves, regulate flow between zones (WYA, 2011).

Zone 1, the most developed of the three existing zones, is supplied water from a 36-inch transmission main that extends north from the John Jones Water Treatment Plant ("JJWTP") along Tracy Boulevard, and from Zone 2 via five pressure sustaining valves. Zone 2, comprised of residential and light industrial water users, is supplied from the Zone 2 Booster Pump Station located at the JJWTP and from the Linne Road Booster Pump Station located near the intersection of Linne Road and MacArthur Drive.

The Safeway and Patterson Pass Business Park developments in Zone 3 are supplied water from the Safeway Booster Pump Station located on Schulte Road east of Patterson Pass Road. The elevations and pressures within each of the three existing and two future pressure zones are summarized in Table 4.

2.7.3 Storage facilities

Tracy has four storage reservoirs (WYA, 2011). Two of these reservoirs are located adjacent to the JJWTP, with a total storage capacity of approximately 4.66 MG. Additional storage is provided by the Northeast Industrial reservoir, with a capacity of 2.4 MG. The fourth storage reservoir is the 7.1 MG capacity reservoir located on Linne Road that was completed in May 2005.

2.7.4 Water Treatment Facilities

As described in Section 4, Tracy's surface water supplies are treated at the JJWTP and by SSJID at the Nick C. DeGroot Water Treatment Plant ("DGWTP"). Groundwater is either treated at the wellhead or at the JJWTP.

2.7.5 SCWSP

SCWSP is a partnership between the cities of Tracy, Manteca, Lathrop, and Escalon and the SSJID which has developed a surface water treatment plant and pipeline system delivering water from the Stanislaus River to each participating agency.

3. WATER DEMAND

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

Water demand is dependent on climate, population, industry, and the types of development present in a community. Sections 3.1 and 3.2 describe Tracy's historical and projected water uses for residential, commercial, industrial, institutional, and landscape irrigation purposes within the City. This discussion does not include uses for the water demand sectors G through I described above. A discussion of these water demand sectors is provided in Section 3.3.

3.1 CURRENT AND HISTORICAL WATER DEMAND

Tracy's current and historical total water uses include the water consumed by metered accounts in the City ("metered water consumption") and the water that is lost or unaccounted for within the system ("unaccounted-for water" or "UAW"). There are no non-potable water uses within the City.

The City's Water Resource Coordinator maintains records of Tracy's historical water demand. Three major trends in Tracy's water demand have been observed:

- *Seasonal fluctuations in demand*: Tracy typically experiences dry summers and wet winters. Tracy's water demand has correspondingly been highest June, July, and August, and lowest in December, January, and February. This seasonal trend in water demand for the years 1990 through 2010 is shown in Table 5.
- *Annual fluctuations in demand*: Since California's precipitation patterns vary from one year to the next, Tracy's water demand fluctuates annually based on local rainfall. In hotter, drier years, irrigation and cooling needs can increase the City's potable water demand above what is needed during cooler or wetter years.
- *Recent decrease in demand*: From 2008 through 2010 Tracy has experienced a decrease in demand. The decrease in demand may be due to the poor economy or variations in weather. The 2007 uses are expected to be more representative of current uses as the economy improves (WYA, 2011).

The following sections provide additional detail regarding Tracy's water uses for the five-year period 2005 through 2010.

3.1.1 Water Demand Sectors

To more fully understand patterns of water demand within Tracy, the metered accounts were divided into the water demand sectors described below. Trends in water demand within each customer sector were tracked using data from the City's Inspironix Water Usage Data System ("WUDS").

- The *Residential Single Family ("RSF")* and *Residential Multi-Family ("RMF")* sectors include all residences including low income residences within the City's SOI.
- The *Commercial* sector includes food-related businesses, such as bakeries and restaurants, and non-food related businesses such as laundromats and car washes.
- The *Industrial* sector includes hotels, mortuaries, dry cleaners, and larger businesses such as Leprino Foods.
- The *Institutional* sector primarily includes government-related services, such as the police and fire departments and City Hall, as well as religious and educational buildings.
- The *Irrigation* sector includes all dedicated irrigation meters at City parks and schoolyards.

A discussion of the other water demand sectors is provided in Section 3.3.

3.1.2 Water Demand Patterns

The residential sectors (*RSF* and *RMF*) account for most of the City's potable water demand (Table 6). The *RSF* sector accounted for an average of 60% of the City's total water demand from 2005 through 2010 and the *RMF* sector accounted for 6% of the City's total water demand over the same period. Accounts with dedicated irrigation meters, the *Irrigation* sector, accounted for nearly 10% of the City's water demand, while the *Commercial* and *Industrial* sectors accounted for 8% and 5% respectively. *Institutional* users accounted for 4% of the total water demand within the City. The remaining demand is a result of UAW (described below). According to the WUDS water consumption data for the period 2005 through 2010, the relative percentage of the total water demand represented by each sector has not changed significantly.

Although the relative proportion of water consumed by each water demand sector has remained nearly constant during this period (2005 through 2010), Tracy's annual water demand decreased by 8% (i.e., from 17,892 ac-ft in 2005 to 16,603 ac-ft in 2010, Table 6). This decrease in water may be from the poor economy or variations in weather. Although restrictions have been adopted to control Tracy's residential growth and encourage infill development (i.e., Measure A), the City still anticipates significant future growth, both in population and in the commercial, industrial, and institutional ("CII") sector with a corresponding increase in the quantity of water needed to serve these additional uses. Future water demand projections for the years 2015 to 2035 are described below, in Section 3.2.

3.1.3 Unaccounted-for Water

Tracy's total water demand is equivalent to the metered water consumption plus water that is lost, or unaccounted for, within the system. The UAW includes water used for fire hydrant flushing

and testing, for water main flushing, and for construction water. This volume of UAW is estimated by comparing metered water demand (i.e., consumption) against total water purchases and groundwater production. Historical UAW is listed in Table 6. UAW for 2005 and 2008 were negative, and are likely the result of inaccurate meter readings. UAW for 2006 and 2009 also appear to be erroneous because of a low values. Excluding these years, the UAW has averaged 7.1 percent from 2000 through 2009 (WYA, 2011). For the purposes of the UWMP, UAW is assumed to be 7.5 percent as used in other City water planning studies.

3.2 PROJECTED WATER DEMAND

As discussed in Section 2, it is estimated that Tracy's population will reach approximately 109,000 people by 2025. Numerous developments have been proposed within the City's SOI to accommodate this growth and will require water to service the additional residential and CII developments. Prior to receiving the City's approval, to the extent required by SB 610 and SB 221 (referred to as the Kuehl-Costa amendments), each of these proposed developments is mandated to estimate its future water uses and to identify water supplies that may be used to meet its uses.[12] This water supply assessment process is intended to ensure that adequate water supplies exist to support proposed developments, and that these water supplies are sufficiently reliable.

The passage of Measure A slowed the pace of development within Tracy. The water demand estimated at full build-out, is as described in the Draft Water System Master Plan, based on the assumed water demand for each proposed development and specific plan and is conservative (i.e., the demand may be overstated.). Additional future water uses for recycled water are discussed in Section 4 of this UWMP.

3.2.1 Projected Water Demand at Build-out

Listed in Table 7 are the future development projects and future planning areas in and around the City and the anticipated water demand associated with each development at full build-out (WYA, 2011). Future water demands for these developments are based on estimated demand factors (i.e., ac-ft of water per acre of development) for residential and commercial developments and the total acreage included by each proposed development and specific plan. Total potable water demand for these proposed developments and specific plans is estimated to be approximately 15,800 ac-ft at full build-out not including unaccounted for water.

Potable water demand projections from 2015 through 2035 are listed in Table 8. Existing water demand for 2010 is also shown in the table. The Draft Water System Master Plan projections are based on 2007 water demands. The 2007 water demands were used, because they may be more representative of actual existing demands than the currently observed lower demands. A linear distribution of demand was assumed from 2007 through build-out in 2040 based on the values shown in Appendix D2 of the Draft Water System Master Plan for 2007 and 2040. Demand for each water demand sector was calculated in the following manner.

[12] The Kuehl-Costa amendments mandate, among other things, that development projects with water demand greater than, or equivalent to 500-dwelling-units and residential subdivisions of more than 500-dwelling-units to identify existing water supply entitlements, water rights or water service contracts relevant to the water supply.

- Residential Single Family. Includes water demand from the Master Plan categories of Residential - Very Low, Residential - Low, and Residential - Medium for both existing and build-out. Per the Draft Water System Master Plan, water demand factors for the residential sector are less than historical water demand factors because water will be used more efficiently in the future. For example, new growth will demand water saving fixtures.
- Residential Multi family. Includes water demand from the Draft Water System Master Plan categories of Residential – High and Residential - Very High for both existing and build-out.
- Future Low Income - Single Family and Multi family. Per Health and Safety Code 50079.5, water demand for the categories of extremely low income and lower income was calculated. The water demand was based on the projected needed number of extremely low income and lower income units for 2009-2014, from the 2009 Housing Element (City of Tracy, 2010). The number of units were multiplied by an assumed 310 gpd per dwelling unit. The water demand per dwelling unit is from the Draft Water System Master Plan based on the conservative assumption the future housing units will be medium density. Demand was split between single and multifamily based on historical City water usage data for these two categories. The same amount of low income demand was assumed to be added during each additional five year period.
- Commercial. Includes water demand from the Draft Water System Master Plan categories of Commercial and Office for both existing and build-out.
- Industrial. Includes water demand from the Draft Water System Master Plan category of Industrial for both existing and build-out.
- Institutional. Includes water demand from the Draft Water System Master Plan category of Public Facilities for both existing and build-out.
- Irrigation. Includes water demand from the Draft Water System Master Plan category of Irrigation for build-out.
- Other. Currently the City has a category for miscellaneous uncategorized water accounts. These accounts are assumed to be incorporated into the other water demand sectors by 2015.

3.3 WATER DEMAND SECTORS NOT INCLUDED IN THE DEMAND PROJECTIONS

This section addresses historical and projected water demands for the water demand sectors described in Section 10631(e)(1) (G) through (I) and listed below:

- Sales to other agencies.
- Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
- Agricultural.

Water demands for these sectors were not included in Tracy's water demand calculations for the reasons described below:

3.3.1 Sales to Other Agencies

Tracy does sell excess CVP supplies on an "as available basis" to other agencies, such as Westlands Water District, however, these sales are not appropriate to include in a water demand

estimate for Tracy because (1) the sales only occur when Tracy has surplus water supplies and (2) Tracy has no obligation to sell the water.

3.3.2 Saline water intrusion barriers, groundwater recharge, and conjunctive use

Tracy does not use water for saline barriers. Currently, Tracy only recharges groundwater as part of a pilot ASR program. Though the City anticipates that its future groundwater management activities will include in lieu groundwater recharge and the potential development of an ASR program (see Section 4.2.3.3), the exact quantity of water demanded by such actions is unknown at this time, nor are such actions expected to increase Tracy's water demand. Tracy will continue to conjunctively manage its water resources (i.e., by using groundwater for peaking purposes during the summer months) (see Section 4.2.5), but again, such conjunctive management activities are not expected to increase Tracy's water demand.

3.3.3 Agricultural

Tracy does not sell water to agricultural customers and does not expect to in the future.

3.4 COORDINATING WATER DEMAND PROJECTIONS

Tracy notifies the USBR each year of the deliveries that it expects to receive from the USBR during the following year. Tracy also notifies the SSJID each year of the deliveries that it expects to receive over the next three years.

3.5 BASELINE WATER USE AND WATER CONSERVATION TARGETS

The Water Conservation Act directs DWR to develop technical methodologies and criteria to ensure the consistent implementation of the Water Conservation Act and to provide guidance to urban retail water suppliers in developing baseline and compliance water use. The Water Conservation Act of 2009 was incorporated into Division 6 of the California Water Code, commencing with Section 10608 of Part 2.55. The methodologies for developing baseline and compliance water use were established in *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water, California Department of Water Resources Division of Statewide Integrated Water Management Water Use and Efficiency Branch,* dated Use October 1, 2010 (DWR, 2010)

The Water Conservation Act specifically calls for developing seven methodologies and a set of criteria for adjusting daily per capita water use at the time compliance is required (the 2015 and 2020 compliance years) under Section 10608.20(h):

1. *The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:*
    A. *Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.*

B. Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

Sections 10608.20 and 10608.28 of the Water Code allow water suppliers the choice of complying individually or regionally by mutual agreement with other water suppliers or regional agencies. DWR has also developed a methodology for regional compliance. The following calculation methodologies have been developed and are described in DWR, 2010:

- Methodology 1: Gross Water Use
- Methodology 2: Service Area Population
- Methodology 3: Base Daily Per Capita Water Use
- Methodology 4: Compliance Daily Per Capita Water Use
- Methodology 5: Indoor Residential Use
- Methodology 6: Landscaped Area Water Use
- Methodology 7: Baseline Commercial, Industrial, and Institutional Water Use
- Methodology 8: Criteria for Adjustments to Compliance Daily Per Capita Water Use
- Methodology 9: Regional Compliance

3.5.1 Baseline Water Use

Water suppliers must define a 10- or 15-year base (or baseline) period for water use that will be used to develop their target levels of per capita water use. Water suppliers must also calculate water use for a 5-year baseline period, and use that value to determine a minimum required reduction in water use by 2020. The 15-year baseline period applies to a water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water. The City baseline water use uses per capita water usage data from 1 January 1995 through 31 December 2004, because the City is planning to but has not yet used recycled water. These data are listed in Table 9. The source of the population estimates are described in Section 2.3. The gross water use is from the Draft Water System Master Plan (WYA, 2011). The baseline water use for this period is 227 gallons per capita per day ("gpcd").

3.5.2 Water Use Targets

An urban retail water supplier must set a 2020 water use target and a 2015 interim target using one of four methods.

- Method 1: Eighty percent of the water supplier's baseline per capita water use
- Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use; landscaped area water use; and commercial, industrial, and institutional uses
- Method 3: Ninety-five percent of the applicable state hydrologic region target as stated in the State's April 30, 2009, draft 20x2020 Water Conservation Plan
- Provisional Method 4: Total savings subtracted from baseline water use. Savings include metering savings, residential savings, commercial, industrial, and institutional savings, and landscape and water loss savings.

The target may need to be adjusted further to achieve a minimum reduction in water use regardless of the target method (this is explained in Methodology 3). The Water Code directs that water suppliers must compare their actual water use in 2020 with their calculated targets to assess

compliance. In addition, water suppliers will report interim compliance in 2015 as compared to an interim target (generally halfway between the baseline water use and the 2020 target level). The years 2015 and 2020 are referred to in the methodologies as compliance years. All baseline, target, and compliance-year water use estimates must be calculated and reported in gpcd. Water suppliers have some flexibility in setting and revising water use targets.

The City's water use targets were calculated by Method 1 as shown in Table 10. The 2020 target is calculated as 80 percent of the baseline water use, or 182 gpcd. The 2015 target is calculated as 90 percent of the baseline water use, or 204 gpcd.

The maximum allowable target is calculated as 95 percent of the City's five year baseline. The City's five year baseline from 2003 through 2007 is 210 gpcd. Therefore, the maximum 2020 target is 200 gpcd. The 2020 target of 182 gpcd is less than the maximum target of 200 gpcd.

3.6 IMPLEMENTATION PLAN

Achieving the 2020 water use target will be based on multiple methods including conservation and recycled water use. Tracy will monitor progress towards the water targets annually. Adjustments to the plan will be made as necessary to keep the City on track for meeting the 2020 target. The implementation plan was reviewed with the public at the 17 May 2011 public hearing.

The methods to decrease per capita water use are discussed below.

3.6.1 Conservation

Tracy plans to increase conservation as discussed in Section 6. Although the City has implemented 13 of the 14 applicable best management practices, the City plans to expand the scope of best management practices. For example, the City plans on completing more single-family and multifamily residential audits each year.

3.6.2 Recycled Water Use

Tracy plans to implement the recycled water program as discussed in Section 4.9. The wastewater treatment plant has been upgraded to produce Title 22 Tertiary Water. The next steps include constructing a recycled water distribution system, developing a recycled water fee structure, and determining recycled water users.

4. WATER SUPPLY SOURCES

10631 (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). . .

The City obtains water from both surface water and groundwater sources. The amount of water that Tracy uses from each of its water supply sources to make up its total water use varies from year to year based on contractual agreements, annual precipitation, and City policy about how to expand, utilize, and manage its water resources. As detailed in Table 11, the amount of water that Tracy uses from each of its water supply sources is listed. As detailed in Table 12, Tracy's maximum annual water supply amounts to over 31,500 ac-ft per year from its USBR contractual entitlements to DMC/CVP water, its groundwater sources, and its allocation of Stanislaus River water via the SCWSP. Future agreements between Tracy and BBID may increase Tracy's total water supply entitlements to approximately 49,500 ac-ft annually. Tracy is working with SSJID and the SCWSP to increase Tracy's allocation by 3,000 ac-ft per year. Potential ASR and out-of-basin water banking opportunities may increase Tracy's future water supply an additional 6,500 ac-ft annually, to be used during drought and emergency situations. Additional water is also potentially available to Tracy through purchase on the open market, either on a one-year basis or through multi-year contracts.

4.1 CURRENT WATER SUPPLY SOURCES – SURFACE WATER

The City's two wholesale surface water suppliers are the USBR (providing CVP water via the DMC) and the SSJID (providing Stanislaus River water). As stipulated by its contract terms, and as part of regular operations, the USBR notifies Tracy each year of the deliveries that it can expect to receive from the USBR. This notification process occurs regardless of whether it is a normal or dry year. Tracy notifies the USBR each year of the deliveries that it expects to receive from the USBR during the following year.

Similarly, the SSJID notifies Tracy of the deliveries that it can expect to receive from the SCWSP on an annual basis. Tracy notifies the SSJID each year of the deliveries that it expects to receive over the next three years. Information related to the contractual entitlement, reliability, and treatment processes for these surface water sources is provided below.

4.1.1 Central Valley Project Water via the Delta-Mendota Canal

Tracy's contractual entitlements to each portion of its supply of DMC/CVP water are discussed below and summarized in Table 12. As discussed more fully in Section 5, the reliability of each of these supplies is anticipated to vary.

4.1.1.1 DMC/CVP Contractual Information

Tracy entered into a 40-year M&I contract with the USBR in 1974 for an annual entitlement of 10,000 ac-ft of surface water from the CVP via the Delta-Mendota Canal. This contract is set to expire in 2014, and Tracy and USBR are currently negotiating its renewal. Tracy expects a renewed contract to be completed in the near future. In the CVP system, an M&I contractor is

eligible for a minimum shortage allocation equal to 75% of adjusted historical use.[13] This minimum shortage allocation may be reduced when allocation of Ag-reliability water is reduced below 25% of contract entitlement (see the CVP M&I Water Shortage Allocation Plan, Appendix D). Tracy's average deliveries of water in the last six years have been 81% of its M&I contract entitlement (WYA, 2011).

As of 2004, Tracy entered into two contract assignments with the USBR for 10,000 ac-ft/yr of agricultural ("Ag") reliable water from the BCID and WSID contracts. This water will also be delivered from the CVP via the DMC. Because this component of Tracy's USBR supply carries Ag-reliability its allocation is much more dependent on yearly hydrologic conditions than Tracy's M&I-reliable allocation. Average deliveries of Ag-reliable water during the last six years have been 55% of the contractual entitlement (WYA, 2011). During extreme dry years however, allocations of DMC water with Ag-reliability has historically been reduced to as low as 10% of its contractual entitlement (WYA, 2011) and potentially could be reduced to 0%.

Tracy also treats and serves DMC/CVP water purchased by others. In 2009, an estimated 360 ac-ft of water from the PVWD's (now BBID's) USBR allocation was treated at the JJWTP and delivered to the Patterson Pass Business Park through Tracy's water distribution system. A comparable quantity of BBID water is anticipated to be treated and delivered annually to the Patterson Pass Business Park in the future. Neither the water supply nor the demand for Patterson Pass Business Park is included in the City supply and demand in this UWMP because the water supply is BBID's, not the City's, and the City provides water treatment, delivery and billing services on a contractual basis. The City does not manage either the supply or the demand.

4.1.1.2 DMC/CVP Treatment Process

Tracy's DMC/CVP water is treated at the John Jones Water Treatment Plant, located at the southern end of the City just east of the DMC and the California Aqueduct. The JJWTP was constructed in 1979, expanded in 1988, and expanded and upgraded again in 2008. The treatment capacity is 30 MGD.[14] The increased capacity will allow the plant to process all of Tracy's surface water supplies, excluding the SCWSP water, which is treated at the DGWTP.

A schematic of the JJWTP facility and treatment process is provided in Appendix E. The treatment process at the JJWTP includes chemical oxidation, temperature equilibration, coagulation, flocculation, filtration, granulated activated carbon adsorption and ultraviolet light disinfection. In this process, chemicals are added for treatment, including sodium permanganate (pre-oxidation), aluminum sulfate (coagulation), a cationic polymer (flocculation promoter), polyphosphates (corrosion suppressants), and powdered activated carbon and potassium permanganate (removal of taste and odor-causing compounds) (Kennedy/Jenks, 1994). Tracy uses chloramines to reduce production of trihalomethanes ("THMs"), a byproduct of free chlorine disinfection that can be detrimental to health if consumed over long periods (City of Tracy, 2000).

[13] Allocation of M&I water will be based on a contractor's historical use of CVP M&I water, adjusted for growth, extraordinary water conservation measures, and non-CVP water. See Appendix D for further explanation.

[14] The plant is designed for an ultimate capacity of 45 MGD. The piping, UV equipment, and other common components are hydraulically designed for the future expanded plant capacity.

4.1.2 Stanislaus River Water

Information related to the contractual entitlements and treatment process of the Stanislaus River water that Tracy receives from the SCWSP is provided below and in Table 12.

4.1.2.1 SCWSP Contractual Information

SSJID has senior pre-1914 appropriative water rights to the Stanislaus River, coupled with an agreement with the USBR to store water in the New Melones reservoir. As part of the SCWSP, Tracy has been allocated up to 10,000 acre-feet per year of water based upon SSJID's senior water rights. This SCWSP water is expected to have high reliability, with Tracy anticipating being able to receive at least 95% of its allocation, even during dry years.

4.1.2.2 SCWSP Treatment Process

The Stanislaus River water is treated at the DGWTP located near Woodward Reservoir in San Joaquin County. The DGWTP incorporates high-rate dissolved air flotation ("DAF") and submerged membrane filtration.[15] The DGWTP currently has a capacity of 36 MGD with a final build-out capacity of 60 MGD. The water treatment process for the DGWTP is shown on Figure 5.

SSJID can deliver either free available chlorine or add ammonia at their Tracy booster pumping station, which is converted to chloramines. Currently when the City's JJWTP is off line for annual maintenance, the SSJID treated water is delivered as free available chlorine since the high quality Sierra water does not contain high total organic carbon ("TOC"), which forms disinfection by-products. During the operation of the City's JJWTP, which uses the Delta Mendota source, the City & SSJID add ammonia to form chloraminated water to abate or reduce disinfection by-products.

4.2 CURRENT WATER SOURCES – GROUNDWATER

The remaining portion of the Tracy water supply is extracted from the 539 square mile Tracy Groundwater Sub-Basin (WYA, 2011). The primary groundwater source for Tracy is the lower water-bearing zones of the Tulare Formation, which is part of a regional aquifer system in the San Joaquin subregion of the Central Valley groundwater basin. These water-bearing zones occur at depths of 300 to 700 feet below ground surface ("ft bgs") and are confined by an extensive clay stratum known as the Corcoran Clay (Kennedy/Jenks, 1994). Tracy operates nine groundwater wells, with a total extraction capacity of 15 MGD. The locations of these wells are shown on Figure 4. The four wells located near the JJWTP (Production Wells 1, 2, 3, and 4) pump directly into the JJWTP's clearwells, where the groundwater is blended with treated surface water. The outlying groundwater wells pump water directly into the distribution system after chloramination.

Pursuant to the UWMP Act, the following Section 4.2 provides information regarding the Basin, the groundwater management plans that have been prepared within the Basin, groundwater management efforts by Tracy and others, and Tracy's historical and projected future uses of groundwater.

[15] Black & Veatch Corporation, August 18, 2005.

4.2.1 Groundwater Basin Description

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (b) . . . . If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

The following section describes the Tracy Groundwater Sub-Basin, including its water-bearing formations, water levels, and water quality. Except where noted, the description of the Sub-Basin is based largely on information provided in *California DWR Bulletin 118*, last updated in February 2003 (DWR, 2003).

4.2.1.1 Tracy Groundwater Sub-Basin Description

The Sub-Basin consists of unconsolidated to semi-consolidated sedimentary deposits that are bounded by the Diablo Range on the west, the Mokelumne and San Joaquin Rivers on the north, the San Joaquin River to the east, and the San Joaquin-Stanislaus County line on the south. Adjacent to the Tracy Groundwater Sub-Basin are the Eastern San Joaquin Sub-Basin to the east, the Delta-Mendota Sub-Basin to the south, and the Sacramento Valley Groundwater Basin to the north (Figure 6). The three Sub-Basins, not including the Sacramento Valley Groundwater Basin, are part of the San Joaquin Valley Groundwater Basin. The San Joaquin River and one of its major westside tributaries, Corral Hollow Creek, provide drainage from the Tracy Groundwater Sub-Basin. The San Joaquin River flows northward into the Sacramento and San Joaquin Delta and discharges into San Francisco Bay.

4.2.1.2 Tracy Groundwater Sub-Basin Geology

The Tracy Sub-Basin is comprised of continental deposits of Late Tertiary to Quaternary age. These deposits include the Tulare Formation, Older Alluvium, Flood Basin Deposits, and Younger Alluvium. The cumulative thickness of these deposits increases from a few hundred feet near the Coast Range foothills on the west to about 3,000 feet along the eastern margin of the Sub-Basin. Each of these formations is described below.

- *The Tulare Formation* is exposed in the Coast Range foothills along the western margin of the Sub-Basin and dips eastward toward the axis of the San Joaquin Valley. The Tulare Formation is approximately 1,400 ft thick and consists of semi-consolidated, poorly sorted, discontinuous deposits of clay, silt, and gravel. The Corcoran Clay occurs near the top of the Tulare Formation and confines the underlying fresh water deposits. The eastern limit of the Corcoran Clay is near the eastern boundary of the Sub-Basin. The Tulare Formation is moderately permeable, with most of the larger agricultural, municipal, and industrial wells completed below the Corcoran Clay and capable of producing up to about 3,000 gallons per minute ("GPM"). Smaller, domestic wells are typically completed

above the Corcoran Clay, where the groundwater is often of poor quality. Specific yield values for the Tulare Formation in the San Joaquin Valley and Delta area range from 7 to 10 percent.

- *The Older Alluvium* is approximately 150 feet thick and consists of loosely to moderately compacted sand, silt, and gravel deposited in alluvial fans during the Pliocene and Pleistocene eras. The Older Alluvium is widely exposed between the Coast Range foothills and the Delta and is moderately to locally highly permeable.
- *The Flood Basin Deposits* occur in the Delta portion of the Sub-Basin and are the distal equivalents of the Tulare Formation and Older and Younger alluvial units. The Flood Basin Deposits consist primarily of silts and clays with occasional interbeds of gravel along the present waterways. Because of their fine-grained nature, the Flood Basin Deposits have low permeability and generally yield low quantities of water to wells. Occasional zones of fresh water are found in the Flood Basin Deposits, but they generally contain poor quality groundwater. The maximum thickness of the Flood Basin Deposits is about 1,400 feet.
- *The Younger Alluvium* includes those deposits that are accumulating, including sediments deposited in the channels of active streams, as well as overbank deposits and terraces of these active streams. The Younger Alluvium, consisting of unconsolidated silt, fine- to medium- grained sand, and gravel, is present to depths of less than 100 ft bgs along the channel of Corral Hollow Creek. Sand and gravel zones in the Younger Alluvium are highly permeable and, where saturated, yield significant quantities of water to wells.

4.2.1.3 Tracy Sub-Basin Groundwater Level Trends

The potentiometric surface in the semi-confined aquifer above the Corcoran Clay is located approximately 90 to 150 ft msl (Stoddard, 1996). Review of hydrographs from wells throughout the Sub-Basin indicates that, except for seasonal variation resulting from recharge and pumping, water levels in most of these wells have remained stable over at least the last 10 years.

4.2.1.4 Tracy Sub-Basin Groundwater Storage

There are no published groundwater storage values for the entire Sub-Basin (DWR, 2004). However, Hotchkiss and Balding (1971) estimated the groundwater storage capacity for the Tracy-Patterson Storage Unit at 4,040,000 ac-ft. The Tracy-Patterson Storage Unit includes the southern portion of the currently-defined Tracy Groundwater Sub-Basin, from approximately one mile north of Tracy to the San Joaquin-Stanislaus County line. Since the Sub-Basin comprises roughly one-third of the Tracy-Patterson Storage Unit, it can be inferred that the approximate storage capacity of the southern portion of the Basin is on the order of 1,300,000 ac-ft.

In an eight-year study conducted by Stoddard & Associates (1996), the average change in Sub-Basin storage was negative 13,000 ac-ft per year. Stoddard & Associates (1996) notes that rainfall during the study period was well under average. In Stoddard's view, the Sub-Basin is in a hydrologically-balanced condition and is not overdrafted.

4.2.1.5 Tracy Sub-Basin Groundwater Quality

Groundwater quality in the Sub-Basin varies spatially and with depth. In general, the northern part of the Sub-Basin is characterized by a sodium water type, and the southern part of the Sub-Basin is characterized by calcium-sodium type water (Sorenson, 1981). The northern part of the Sub-Basin is also characterized by a wide range of anionic water types, including bicarbonate; chloride; and mixed bicarbonate-chloride. Major anions in the southern part of the Sub-Basin include sulfate-chloride and bicarbonate-chloride.

There is also a difference between the water quality in the water-bearing zones above the Corcoran Clay (termed the "semi-confined aquifer" in the following discussion) and below the Corcoran Clay (the "confined aquifer") (see Table 12 of Appendix F). Generally, the water quality of the confined aquifer is better than that of the semi-confined aquifer (Stoddard, 1996). Total dissolved solids ("TDS") concentrations in well water sampled in the semi-confined aquifer ranged between 1,000 milligrams per liter ("mg/L") and 1,500 mg/L, while the measured TDS in the confined aquifer was less than 1,000 mg/L (Stoddard, 1996). In the vicinity of Tracy, the TDS of the confined aquifer is between 600 mg/L and 700 mg/L (Stoddard, 1996).

Analytes present at elevated concentrations throughout the Sub-Basin in both the semi-confined and confined aquifers include chloride, nitrate, sulfate, and boron. Elevated chloride occurs in several areas near Tracy and along the San Joaquin River. Areas of elevated nitrate occur in the northwestern part of the Sub-Basin and in the vicinity of Tracy. Elevated boron occurs over a large portion of the Sub-Basin from south of Tracy extending to the northwest side of the Sub-Basin. Sulfate concentrations of up to 500 mg/L have been detected in Sub-Basin groundwater. The groundwater near Tracy is considered to be very hard (Stoddard, 1996).

4.2.2 Basin Groundwater Management Plan

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
(b) . . . . If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

The 1992 Groundwater Management Act, AB 3030, established provisions by which local water agencies could develop and implement groundwater management plans ("GMPs"). GMPs are generally designed to prevent local and regional aquifer overdrafting, which reduces available groundwater resources and which, under certain conditions, can lead to degradation of water quality and to land subsidence.

Tracy has been, and continues to be, involved in both regional and local groundwater management efforts. Tracy participated in the development of a Groundwater Management Plan for the entire Tracy Groundwater Sub-Basin in 1996, called the Regional GMP, and is involved in the updating of this document. A description of the objectives and content of the Regional GMP is provided below in Section 4.2.2.1, with excerpts included as Appendix F. In addition, information regarding the San Joaquin County Groundwater Export Ordinance is provided.

4.2.2.1 Tracy Sub-Basin Regional Groundwater Management Plan

The Regional GMP, developed in 1996 in response to concerns regarding the declining quality of Sub-Basin groundwater, encompasses the area shown on Figure 2 of Appendix F. Other participants in the development and implementation of the Regional GMP include the agencies that overly and, in some cases, extract water from the Tracy Groundwater Sub-Basin within the DMC/CVP's northern service area. These agencies include the Plain View Water District (now part of the Byron-Bethany Irrigation District), Banta-Carbona Irrigation District, Del Puerto Water District, West Stanislaus Irrigation District, Patterson Water District, West Side Irrigation District, and the San Joaquin County Flood Control and Irrigation District. The location of these districts is shown on Figure 7.

Based on a hydraulic inventory of the Sub-Basin, the Regional GMP is designed to monitor groundwater impacts to the Sub-Basin and to promote the sustained use of groundwater resources. The Regional GMP discusses:

- Control of saline water intrusion
- Identification and management of wellhead protection areas
- Migration of contaminants in groundwater
- Administration of a well abandonment and well destruction program
- Mitigation of groundwater overdraft
- Replenishment of extracted groundwater
- Monitoring of groundwater levels and storage
- Facilitation of conjunctive use

- Well construction
- Construction and operation of groundwater management facilities
- Relationships with State and Federal regulating agencies
- Review of land use plans to assess risk of groundwater contamination.

The Regional GMP is being updated to present new data related to water levels and water quality and to bring the document into compliance with SB 1938, which was passed in 2002.[16] SB 1938 establishes criteria for topics are to be included in a GMP, including (1) establishment of basin management objectives ("BMOs"), (2) involvement of other local agencies in a cooperative planning effort, and (3) adoption of monitoring protocols that promote efficient and effective groundwater management.

4.2.2.2 San Joaquin County Groundwater Export Ordinance

Occasional drought conditions and ongoing restrictions on Delta export pumping have reduced the imported CVP surface water supply available to entities located south of the Delta that rely on DMC/CVP water (Stoddard, 1996). Arrangements for water transfers between entities that receive DMC/CVP water evolved to allocate the reduced DMC/CVP supply to match demand, including pumping of groundwater into the DMC for conveyance and use in other areas. This additional groundwater extraction, for the purpose of selling it to other DMC/CVP users, raised concerns amongst Sub-Basin groundwater users regarding groundwater overdraft and quality degradation. In response to these concerns, San Joaquin County enacted a Groundwater Export Ordinance in June 2000 that now requires an entity to secure a permit from San Joaquin County prior to exporting groundwater out of the County, such as by pumping extracted groundwater into the DMC for conveyance to other areas (WYA, 2011).

4.2.3 Tracy Groundwater Management

On a local level, in 2001 Tracy adopted a *Groundwater Management Policy*, and prepared a *Groundwater Management Policy Mitigated Negative Declaration*. In 2007, Tracy developed a Tracy Regional Groundwater Management Plan ("Tracy GMP") that is included in Appendix G. The *Groundwater Management Policy*, the *Groundwater Management Policy Mitigated Negative Declaration*, and the Tracy GMP are described below. Tracy's efforts to develop an ASR project are also discussed.

4.2.3.1 Tracy Groundwater Management Policy and Mitigated Negative Declaration

In 2001, Tracy anticipated that, to make up a projected shortfall between supply and demand, groundwater extraction would have to increase from approximately 6,000 ac-ft per year to a

[16] In September 2002, SB 1938 was signed into law. The act amends existing law related to groundwater management by local agencies. The law requires any public agency seeking State funds administered through DWR for the construction of groundwater projects or groundwater quality projects to prepare and implement a groundwater management plan with certain specified components. Prior to SB 1938, there were no required plan components. The requirements apply to agencies that have already adopted groundwater management plans as well as agencies that do not overlie groundwater basins identified in Bulletin 118 and its updates. The requirements do not apply to funds administered through the Local Groundwater Management Assistance Act or to funds authorized or appropriated prior to September 1, 2002.

maximum of 9,000 ac-ft per year over the three-year period 2001 through 2004.[17] Prior to 2001, it had been estimated that 6,700 ac-ft per year was Tracy's sustainable groundwater extraction rate (Kennedy/Jenks, 1990). However, a groundwater study by Navigant Consulting, completed in 2001, revised the estimated average annual operational groundwater yield to 9,000 ac-ft per year. This operational yield, though larger than the earlier estimate, is still well under the City's estimated 22,000 to 28,000 ac-ft per year share of the Sub-Basin's sustainable yield (PMC, 2001).

Pursuant to the findings of the Navigant (2001) study, the Tracy City Council adopted a Groundwater Management Policy in 2001 that established Tracy's maximum annual groundwater extraction rate at 9,000 ac-ft per year. To comply with the California Environmental Quality Act ("CEQA") and to evaluate the potential negative effects of increased groundwater extraction on water quality, water levels, and subsidence, the City also prepared a *Groundwater Management Policy Mitigated Negative Declaration* (Appendix H). The *Groundwater Management Policy Mitigated Negative Declaration* specifies, among other things, the frequency and type of monitoring and reporting the City must conduct to evaluate the sustainability of the increased groundwater extraction rate.

Consistent with the *Groundwater Management Policy Mitigated Negative Declaration*, Tracy has maintained groundwater production rates well below the estimated sustainable yield of 9,000 ac-ft per year. In addition, Tracy has hired a consultant (GEI Consultants, Inc., Bookman-Edmonston Division or "GEI") to monitor the impacts of the increased groundwater extraction (at rates up to approximately 8,000 ac-ft per year) on groundwater levels, groundwater quality, and land subsidence. The findings of GEI's most recent *Summary of Groundwater Conditions* (GEI, 2009) are summarized below and in Appendix I.

Background: In Tracy, groundwater is extracted primarily from the Tulare Formation, which is divided by the Corcoran Clay into an upper, semi-confined zone and a lower, confined aquifer. Pursuant to the Groundwater Management Policy Mitigated Negative Declaration, the lower aquifer was further subdivided into four zones (Zone A through Zone D). The upper aquifer, approximately 200 feet thick beneath Tracy, consists of lenticular deposits of sand, gravel, and clay (Padre, 2002). The lower aquifer is approximately 500 feet thick beneath Tracy and consists of individual beds of sand and gravel that are not always laterally extensive and that can be highly variable (Zones A through D; Padre, 2002). An upward vertical gradient exists between the lower and upper aquifers.

Monitoring Network and Monitoring Frequency: To conduct hydrogeologic monitoring and assessment of the portion of the Sub-Basin underlying Tracy, the City installed several monitoring wells that are screened through Zones A through D as follows:

- Four nested monitoring wells (PW-5A through PW-5D) were installed adjacent to Production Well 5;
- Six sets of three nested wells were installed around Tracy (MW-1 through MW-6) in late 2003 through early 2004; and
- Two monitoring wells were installed adjacent to Production Well 8.

[17] According to the Navigant (2001) study, 9,000 ac-ft per year is the sustainable yield of the aquifer beneath Tracy.

These monitoring well locations are shown on Figure 4. The construction details are provided in Appendix I. Water level measurements from the production and monitoring wells are collected and recorded to the nearest 0.01 foot. Water level trends are compared with the San Joaquin Valley Water Year Index published by DWR to isolate local groundwater extraction impacts from regional trends in groundwater elevation. Water quality samples are collected annually.[18] Benchmarks have been established at each monitoring and production well using global positioning system ("GPS") technology that allows for accuracy within two centimeters. An annual benchmark survey was last conducted in 2008.

Summary of Findings: Since 2001, GEI on behalf of Tracy prepared reports monitoring impacts from increased groundwater extraction. Recent findings by GEI (2009) are summarized below and in Appendix I:

- *Groundwater Contours*. In Zone A (the aquifer located directly below the Corcoran Clay), groundwater generally flows from recharge areas in the northeast and south towards Production Wells 1 through 4. In Zone B (the intermediate aquifer), groundwater flows from the east toward the pumping tough in the vicinity of Production Wells 1 through 4. In Zone C (the deep aquifer), groundwater flows from east to west beneath the City. Pumping depressions are located in the vicinity of the active production wells, which are typically screened through all three of these productive zones.
- *Groundwater Storage*. Groundwater levels have generally been stable to slightly increasing beneath Tracy.
- *Groundwater Quality*. Key water quality parameters have remained consistent over the monitoring period. In the production wells, concentrations of TDS and sulfate exceeded their respective secondary maximum contaminant levels ("MCLs") of 500 mg/L and 250 mg/L.[19] Several monitoring wells also have TDS, chloride, sulfate, iron, and manganese above secondary MCLs.
- *Land Subsidence*. Little, if any, subsidence occurred between benchmark elevations surveyed in 2007 and those surveyed in April 2008. All stations showed a slight increase in elevation, suggesting that, if subsidence is occurring, it is regional and not associated with pumping at any City extraction well.

4.2.3.2 Tracy Groundwater Management Plan

In addition to participating in the development of the Regional GMP, Tracy prepared a Groundwater Management Plan in 2007 for the portion of the Tracy Groundwater Sub-Basin that underlies the City of Tracy (GEI, 2007). The Tracy GMP development and implementation facilitated a coordinated, regional approach to groundwater management in the Tracy Sub-Basin.

The Tracy GMP's objectives are to (1) comply with protocols established by SB 1938, (2) develop a conjunctive use program to optimize Tracy's use of its surface and groundwater supplies, and (3) develop effective and implementable BMOs that reflect current and projected future Sub-Basin conditions and groundwater use and that will protect groundwater resources. Topics include:

[18] Groundwater is sampled for major cations and anions, plus nitrate, boron, selected metals, and alpha activity.
[19] http://www.epa.gov/safewater/consumer/2ndstandards.html

- Current and future regional land and water use settings;
- Water supply setting, including information related to available water supplies, groundwater use trends, known groundwater impairments, and future water supply options;
- Hydrogeologic setting, including soil and near-surface geologic conditions, aquifer systems, water level and water quality data, and land subsidence information;
- Basin Management Objectives, including BMOs regarding groundwater protection, groundwater use/recharge, and definition of groundwater management areas;
- The Groundwater Monitoring Plan; and
- The Tracy GMP Implementation Plan.

4.2.3.3 Aquifer Storage and Recovery

The City's ASR program would allow Tracy to optimize conjunctive use of its water supplies through injection of treated (potable) drinking water into selected aquifer zones within the Sub-Basin for storage when surplus supplies are available, and recovery of that potable water from the aquifer to optimize water quality, meet seasonal peak demands, during droughts, or when emergency or disaster scenarios preclude the use of imported water supplies (Padre, 2004). Tracy has obtained approval from the Central Valley Regional Water Quality Control Board ("CVRWQCB") for a pilot ASR project, which is underway.

4.2.4 Historical Groundwater Use

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631. (b) . . . . If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

Tracy operates nine groundwater extraction wells, including the Lincoln Well, Production Wells 1, 2, 3, 4, 5 (Lewis Manor), 6 (Park & Ride), 7 (Ball Park), and Production Well 8.[20] Well 8 was equipped in October 2010 as an injection and extraction well. The City is using Well 8 as an injection and extraction well as part of the City's pilot ASR program. The locations of the production wells are shown on Figure 4.

Historically, groundwater has accounted for approximately 40 to 50% of the City's water supply. Prior to 2001, groundwater extraction in Tracy totaled less than 6,000 ac-ft per year. Between 2001 and 2004, to meet increased demands for water, Tracy began extracting additional groundwater, ranging from 6,878 ac-ft and 7,717 ac-ft each year. In 2005, groundwater extraction decreased to approximately 6,000 ac-ft because (1) the SCWSP was completed and Tracy began receiving Stanislaus River water, and (2) rainfall was above normal, meaning that Tracy received a high percentage of its DMC/CVP contractual entitlements. From 2006 through 2010 groundwater extraction ranged from 3,672 to 498 ac-ft each year, because more water was used from SSJID.

[20] The Tidewater well was replaced with Well 8 (WYA, 2011).

As described in Section 4.2.5, Tracy's use of groundwater is expected to remain similar in the future.

4.2.5 Projected Future Groundwater Use

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631. (b) . . . . If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

An assessment of the aquifer beneath Tracy indicates an average annual operational yield of 9,000 ac-ft per year (Navigant, 2001). Because the hard, high-TDS groundwater is of low quality compared with Tracy's surface water sources, Tracy is planning to scale back its groundwater extraction. Tracy will continue to rely on groundwater for peaking and drought and emergency supplies, among other things. As can be seen in Table 12, groundwater extraction will continue to occur at selected production wells, but Tracy anticipates that total extraction during a normal year may decrease to less than 2,500 ac-ft per year by 2015. By reducing groundwater extraction on an average annual basis, the City will (1) increase the overall quality of its drinking water, thus increasing customer satisfaction and reducing system maintenance and repair caused by the lower-quality groundwater; and (2) recharge the underlying aquifer, effectively increasing the availability of groundwater during a drought or emergency condition (i.e., Tracy will effectively be "banking" its groundwater). These potential uses of groundwater during droughts are consistent with Tracy's *Groundwater Management Policy* (PMC, 2001). In the event that Tracy is unable to secure additional high quality surface water supplies in the future, groundwater remains a viable water supply up to 9,000 ac-ft per year.

If Tracy decreases future groundwater extraction during normal and wet years, the current patterns of water levels, groundwater flow directions, and groundwater quality would be expected to change correspondingly. Further, if Tracy moves ahead with its proposed ASR program, changes in groundwater flow patterns associated with the introduction of treated surface water into aquifer zones may occur. In this way, a focused groundwater recharge area would be created. Groundwater quality would be expected to improve as a result of the introduction of higher quality surface water into the aquifer.[21]

4.3 CURRENT WATER SOURCES – NON-POTABLE WATER

Non-potable water sources are described in the following sections and are summarized in Table 13.

4.3.1 Diversion of Non-Potable Water from Sugar Cut

Since at least 1912, the City's Holly Sugar property has been irrigated using untreated surface water diverted from Sugar Cut. The site is designated as agricultural use, but is proposed to be

[21] From Padre (2004): The injection source water is characterized as low salinity water, sodium bicarbonate/sulfate dominated, with low alkalinity and hardness. The superior quality of the injected water will be both easily tracked and beneficial to overall basin water quality.

converted to the Holly Sugar Sports Park. The use of untreated surface water from Sugar Cut for nonpotable water uses for the proposed park would be for the interim only, until recycled water supplies become available (WYA, 2011).

Water from Sugar Cut is not considered to be part of the City's water supply, because the water does not enter into the City's distribution system and the City does not buy or sell the water, or provide the water service. The tenant farmer pumps the water from the Sugar Cut and uses it on land adjacent to the Sugar Cut.

4.3.2 Interim Raw Water Supply from West Side Irrigation District

A portion of the water demand for the Gateway ponds and the Gateway roadway landscaping irrigation may be met with nonpotable raw water (WYA, 2011). Untreated raw water supplies purchased from the WSID may be used to meet irrigation demands at these sites until recycled water becomes available at the site.

4.4 CURRENT OR PROJECTED SUPPLY INCLUDES WHOLESALE WATER

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water -year types in accordance with subdivision (c), An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

Tracy purchases most of its water from two wholesale water suppliers, the USBR and the SSJID. Tracy's contractual entitlements to the USBR's CVP water via the DMC are described above in Section 4.1.1 and in Table 12. Information related to the reliability of the DMC/CVP water is provided in Section 5 and in the USBR M&I Water Shortage Policy, which is included as Appendix D.

The terms of the City's contract with SSJID allow Tracy the right to purchase as much as 10,000 ac-ft of water annually from the SSJID. As discussed above and in Section 5, the water from SSJID is effectively 100% reliable, although for planning purposes, a 95% reliability has been assumed.

4.5 POTENTIAL WATER SUPPLY PROJECTS AND PROGRAMS

10631 (h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply

that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

Planned and potential future sources of Tracy's water are outlined in Table 12.

4.5.1 Future Surface Water Supplies

As described below, Tracy is pursuing several other water supplies.

4.5.1.1 Byron Bethany Irrigation District DMC/CVP Water

Up to 11,000 ac-ft/yr of surface water from the BBID would be delivered to the JJWTP.

The Plain View Water District, a USBR contractor, merged with BBID. The City of Tracy is negotiating an agreement with BBID to assign a portion of the USBR water to the City as agricultural water is no longer needed. Agreements between Tracy, BBID and the USBR as well as environmental compliance, would need to occur before such a transaction could take place.

4.5.1.2 Byron Bethany Irrigation District Pre-1914 Water

Because part of the Tracy Hills Specific Plan area was annexed into the Byron-Bethany Irrigation District, Tracy anticipates purchasing up to 3,000 ac-ft of Pre-1914 water right water on an annual basis from BBID to serve future developments in BBID service area. Future work to secure this water source includes finalized agreements between Tracy and BBID, completion of environmental documentation, completion of a Water Supply Assessment, and execution of an exchange agreement with the USBR. BBID and USBR are preparing the exchange agreement and anticipate that this water supply source will be available by 2015.

4.5.1.3 SCWSP Pre-1914 Water

Tracy is pursuing an additional 3,000 ac-ft/yr of treated potable water from the SCWSP. The additional water is anticipated to be available by 2015.

4.5.2 Aquifer Storage and Recovery

As described above in Section 4.2.3.3, an ASR pilot program is being conducted. The goal of the ASR program is to store surplus treated surface water in the confined aquifer beneath Tracy and extract that water to meet peak demands or supplement surface water sources during dry years. It is estimated that as much as 685 ac-ft to 915 ac-ft per year of potable water could be injected into the aquifer, assuming a 5-month continuous injection rate of 1.5 to 2.0 MGD at Production Well 8 (WYA, 2011).

As can be seen in Table 12, Tracy anticipates that, under an ASR program, approximately 3,000 ac-ft of high-quality groundwater would be available, including in drought years, thereby increasing the reliability of Tracy's water supply and closing the potential future gap between supply and demand during drought or emergency conditions.

4.5.3 In Lieu Recharge

In the future, Tracy intends to increase the use of its surface water resources in lieu of increased groundwater pumping. In lieu recharge allows groundwater levels to rise because groundwater that would have otherwise been extracted now remains in the basin, thus increasing the quantity of groundwater in storage. This water is then available for subsequent use during drought years, or under other circumstances when surface water sources are insufficient for Tracy's needs, unavailable or otherwise utilized.

4.5.4 Out-of-Basin Water Banking

Tracy is pursuing banking water in one of the Kern County water banks. Water storage capacity is available in the Semitropic Water Bank ("Semitropic"). To store water in Semitropic, Tracy would not withdraw its CVP water from the DMC, such that this water would move through the DMC and California Aqueduct systems for delivery to Semitropic. During a drought, Semitropic would pump the stored water into the California Aqueduct and a like amount of water would be available to Tracy to pump from the DMC. Tracy may purchase up to 10,500 ac-ft of storage volume (WYA, 2011). If this storage were secured, it would provide Tracy with up to 3,500 ac-ft of water annually for three years. Though the City could utilize this supply in any year, it would be most valuable during drought years when the City's surface water supplies are reduced. If Tracy uses water from the Semitropic water bank in any given year, it would work to manage its supplies during subsequent years such that it could "refill" its water bank for future use.

A permanent water banking agreement with Semitropic will require confirmation that the USBR had no objection, compliance with the National Environmental Policy Act ("NEPA"), and compliance with the California Environmental Quality Act ("CEQA"). The permanent agreement is expected to be completed in the near future. City Council has approved the agreement, but the City is waiting for approval from the USBR.

As described in Section 5, Tracy anticipates that, by banking water at Semitropic, Tracy will increase the reliability of Tracy's water supply and help close the potential future gap between supply and demand during drought or other emergency conditions.

4.5.5 Water Exchange Program

In October 2001, the City implemented a Water Exchange Program ("WEP") that involves the phased conversion of several City parks and other irrigated areas to recycled/non-potable water for irrigation. The conversion of these sites to recycled/non-potable water will free potable water being used for irrigation, allowing its use elsewhere. The City is prepared to make these potable water supplies available for new developments, under the condition that the proponents of such developments provide an equivalent amount of recycled water for irrigation purposes within the City. Tracy is working with the Gateway Development Project to develop the City's first WEP. However, the Gateway Development Project may obtain water from sources other than recycled water.

The potential amount of recycled water use, and thus the amount of potable water supplies made available through this program, will depend on the number and extent of irrigation sites converted. Preliminary estimates indicate that over 780 ac-ft per year of potable water supplies may

eventually become available through this program (WYA, 2002). The WEP is expected to develop in phases, initially utilizing untreated water supplies, such as those available from WSID, in the interim period before Title 22 recycled water becomes available in the City. Additional discussion regarding the WEP is provided in Section 4.9.

4.5.6 Recycled Water

As described in more detail in Section 4.9, pursuant to the Recycled and Non-Potable Water Ordinance adopted by the City Council in 2002 (Ordinance No. 1035, TMC 11.30, see Appendix J), all new subdivisions are required, to the extent practicable, to install the required infrastructure (such as dual-distribution pipelines) to provide recycled water to meet non-potable water demands at parks, golf courses, athletic fields, schools, median island landscapes, and industrial sites.

4.6 DEVELOPMENT OF DESALINATED WATER

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Underlying the City is shallow groundwater that is not suitable for direct use (WYA, 2011). However, the shallow groundwater may be treated using membrane treatment technology. The concern with membrane treatment is the cost of brine disposal and energy. At this time, Tracy is not contemplating development of a desalinated water program.

4.7 TRANSFER AND EXCHANGE OPPORTUNITIES

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

Tracy exercises its options to purchase and sell DMC/CVP surface water on the water market.[22] Traditionally, Tracy has sold its surplus USBR project water to Westlands Water District in Fresno County through this annual transfer process. During drought periods, Tracy has the ability to purchase water on the spot market as necessary.

4.8 INDIRECT POTABLE REUSE

Indirect potable reuse is not a viable option for the City currently, because the treated wastewater is not high enough quality. The City will not pursue indirect potable reuse at this time.

4.9 RECYCLED WATER PLAN

Water recycling can offset the use of potable supplies and reduce the quantity of discharged wastewater. Recycling water involves treating wastewater to an acceptable level such that it can

[22] A water market exists so that, subject to USBR approval, agencies can sell to or buy water from other water users that have an excess supply of water or may need additional water to support demand. These annual transfers are subject to USBR approval and are for one year only.

be reused for irrigation, cooling, and other non-potable applications. A Draft Recycled Water System Master Plan was prepared in 2010 and is included in Appendix K.

The regulatory requirements for recycled water are defined in the California Code of Regulations, Title 22, Article 3. The extent of treatment needed varies for different permitted uses as listed in Table 14. Because recycled water is treated wastewater, its availability is closely linked to the treatment capability of the City's Wastewater Treatment Plant ("WWTP").

The following sections describe Tracy's existing and planned wastewater treatment and water recycling facilities and discuss existing and projected uses of recycled water. A description of Tracy's efforts to commence recycled water use in existing and proposed developments is included in this section.

4.9.1 Coordination

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

The City is the sole agency responsible for water, wastewater, groundwater, and planning within Tracy's service area. However, Tracy's efforts to increase use of recycled water has required coordination between the City and stakeholders. To commence recycled water use within new and existing developments, Tracy's Department of Public Works is coordinating planning efforts with proponents of the proposed Tracy Gateway and Tracy Hills developments.

4.9.2 Wastewater System Description

10633 (a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

Tracy has an existing WWTP and proposes to construct an additional water reclamation facility in the future as described in the following sections.

4.9.2.1 Existing Wastewater Collection System

Tracy maintains and operates the wastewater collection system that conveys wastewater to the existing wastewater treatment plant. The collection system includes pipelines and lift stations.

4.9.2.2 Existing Wastewater Treatment Plant

Tracy's WWTP is located north of Interstate 205, between MacArthur Drive and Holly Drive. Tracy completed a WWTP upgrade in 2008. The plant discharges effluent through two outfalls at Old River. The National Pollutant Discharge Elimination System ("NPDES") permit CA0079154 currently allows for the discharge of 10.8 MGD of average dry weather flow ("ADWF") and up to 16 MGD if applicable permit requirements are met. The permit, which is administered by the Central Valley Regional Water Quality Control Board, sets forth the maximum allowable discharge rate, effluent quality requirements, discharge prohibitions, receiving water limitations,

pretreatment program requirements, biosolids disposal requirements, and self-monitoring guidelines.

The WWTP provides disinfected tertiary level treatment meeting Title 22 requirements. Equipment at the WWTP includes primary clarifiers, activated sludge, secondary clarifiers, flocculation, and tertiary filtration. The City's major industrial wastewater producer, Leprino Foods, conveys its wastewater through a separate force main to pre-treatment ponds that are operated by Leprino and located on WWTP property. A significant portion of the biochemical oxygen demand ("BOD") is removed in this pre-treatment pond before the food process wastewater is conveyed to the WWTP. The main treatment processes at the WWTP are described below and are shown schematically on Figure 8:

- Aerated holding ponds partially treat the Leprino Foods industrial flows before treatment;
- Pre-treatment removes coarse solids;
- Primary treatment removes most settleable and floatable material;
- Secondary treatment with activated sludge reduces levels of soluble organic material and suspended solids;
- Secondary clarification
- Flocculation and tertiary filtration;
- Chlorination disinfects treated wastewater, followed by sulfonation for dechlorination;
- Treated plant effluent is discharged to the Old River; and
- Solids are thickened, digested, and then spread in sludge drying beds.

After treatment, wastewater is disinfected and dechlorinated and discharged into Old River.

Waste solids from the wastewater treatment processes are collected and conditioned for disposal. The treatment process for solids includes thickening, digestion, and dewatering. Dried biosolids are hauled off-site and land applied. This off-site hauling and disposal practice is expected to continue in the future.

4.9.2.3 Future Water Recycling Facilities

A future Water Recycling Facility ("WRF") is proposed. The Tracy Hills Water Recycling Facility is proposed to treat water to a Title 22 Disinfected Tertiary Standard and would be located near the airport (WYA, 2011). The facility would be constructed as part of the Tracy Hills development and provide additional recycled water treatment capacity for the future development.

4.9.3 Wastewater Quantity, Quality and Current Uses

10633 (b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.
(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

The WWTP currently has a treatment capacity of 10.8 MGD. The average daily flow rate of wastewater collected and treated at the WWTP between 2005 and 2010 was 8.93 MGD. The City's wastewater discharge has decreased over the past several years, from a daily average of 9.6 MGD in 2005 to 8.8 MGD in 2010, because of the decrease in potable water use. The flow is

expected to grow as future developments come online. At build-out in 2040, the wastewater projection is 22 MGD per the Draft Wastewater System Master Plan (CH2M Hill, 2010). As listed in Table 15, wastewater flow is expected to increase linearly from 2010 through 2035. The recycled water from the WWTP is currently discharged to Old River.

4.9.4 Potential and Projected Recycled Water Demand

10633 (d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.
10633 (e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

The City is pursuing use of recycled water in and around Tracy. Measures include (1) a City ordinance mandating that all new developments include non-potable pipelines for irrigation, (2) a program to exchange portions of the City's potable water supply, used in City parks and dedicated irrigation areas, for non-potable water from proposed developments such as the Tracy Gateway Project (3) preparing a Draft Recycled Water System Master Plan, and (4) pursuing recycled water opportunities for other projects. These programs are described in more detail below.

4.9.4.1 Potential Recycled Water Demand

Potential recycled water use are described below.

Water Exchange Program
As described in Section 4.5.5, Tracy has developed a Water Exchange Program in an effort to allocate its available potable water resources to the highest and best uses. The WEP facilitates the exchange of potable water supplies that are being used to meet irrigation demands within the built-out portion of Tracy for recycled water or for non-potable water that is treated at wastewater treatment plants located in new residential and CII developments. The potable water that was being formerly used for irrigation purposes within Tracy will then be allocated to the new developments.

Several schools, parks, and other areas within the City have been identified as potential candidates for conversion to recycled water. To provide the selected areas with recycled water, the City's existing recycled water infrastructure must be expanded to connect the selected areas with WWTPs associated with these new developments. Expansion of the recycled water infrastructure will involve the installation of recycled water distribution mains in several of the City's arterial streets, including Tracy Boulevard, Lammers Road, Corral Hollow Road, MacArthur Drive, and Eleventh Street. Recycled water pump stations and storage reservoirs will also be required. The expansion of the City's recycled water infrastructure will be completed in phases as additional developers participate in the WEP.

The 538-acre Gateway Project is the first development to engage in the WEP with the City. The Gateway Project may build an on-site wastewater treatment plant to supply 29 potential sites within Tracy with 780 ac-ft per year of recycled water (WYA, 2002). Irrigation demands at these sites will be converted to recycled water in phases. During Phase 1 of the Gateway Project,

untreated raw water supplies purchased from the WSID may be used to meet irrigation demands at these sites until completion of wastewater recycling facilities.

Recycled Water Distribution System Requirement for New Developments
New developments in Tracy are required to include recycled water distribution systems in accordance with the City's Recycled and Non-Potable Water Ordinance (TMC Chapter 11.30; see Appendix J). The requirements of the Recycled and Non-Potable Water Ordinance facilitate the future use of recycled or other non-potable water for irrigation purposes within the new development. The Tracy Gateway Project, for example, anticipates a recycled/non-potable water demand of 760 ac-ft per year for a golf course, landscaping, and roadway medians within the Gateway Project development itself . This irrigation demand is projected to be met with recycled water or with untreated water from WSID's Upper Main Canal.

The plans for the Tracy Hills development also provide for a wastewater recycling plant that will provide approximately 3,000 ac-ft per year of tertiary-treated recycled water to offset potable water demands for irrigation within this development (Nolte, 2000b).

Recycled Water System Master Plan
A build-out recycled water system evaluation is being prepared as part of the Draft Citywide Water System Master Plan (WYA, 2011). As part of the draft plan, preliminary recycled water demand estimates have been developed based on the overall projected land use from each proposed development project. The projected recycled water demand projections are listed in Table 16.

Other Potential Projects
The City Council has reviewed the request to supply recycled water to the Mulqueeney Ranch Pumped Storage Project and the power generation facility on Roberts Island in San Joaquin County (City of Tracy, 2009). The Mulqueeney Ranch Pumped Storage Project proposes to construct a new electric power plant in the foothills near Patterson Pass. The power plant would require the use recycled water provided by the City. The project would include pumping water stored in a lower reservoir to an upper reservoir during periods of low energy use. Power would be generated by flowing water from the upper reservoir through a turbine to the lower reservoir[23]. The Roberts Island project proposes to construct an electrical plant on Roberts Island. The power plant would also like to use recycled water provided by the City. The preliminary recycled water demands for these projects are listed in Table 16.

The City is considering the implementation of the Tracy Green Energy Project[24]. The project would use renewable energy fuel sources to fuel boilers that produce steam to generate electricity. Recycled water would be used for the boilers. The heat energy would then be used to thermally desalinate the boiler brine. The steam condensate is essentially distilled water and would be blended back into the effluent to reduce the salinity of the effluent.

[23] From personal communication with Steve Bayley on 18 November 2010.
[24] From personal communication with Steve Bayley on 7 March 2011.

4.9.4.2 Projected Recycled Water Demand

Recycled water demand projections in five-year increments between 2010 and 2035 are listed in Table 17. The timing of the projects described in the draft Water System Master Plan and future development are unknown. Therefore, for the recycled water demands listed in the draft Water System Master Plan, a linear growth of recycled water demands was assumed between 2010 that had no recycled water demand and 2040 with the build-out of the recycled water systems. Potential timing of the Mulqueeney Pumped Storage Project, the Roberts Island project, and the Tracy Green Energy Project is unknown at this time.

The exchange of potable and non-potable water between City parks and Tracy's Gateway Project is expected to begin by 2015. Although construction of recycled water infrastructure would begin during Phase I of the Gateway Project construction, park irrigation demands would be satisfied by the potable water system until the construction of the water system infrastructure is completed. In the future, approximately 780 ac-ft per year of irrigation demand is anticipated to be met with recycled water.

Recycled water demands within the Tracy Hills development are expected to begin after 2015. Since Tracy Hills is a primarily residential development, its growth will be impacted by the residential growth restrictions pursuant to Measure A. Once completed, the Tracy Hills project is expected to use 3,000 ac-ft per year of recycled/non-potable water.

4.9.4.3 Current Recycled Water Demand Compared to Previous Projections

The 2005 UWMP projected recycled water demand starting in 2010 at 7,443 ac-ft/yr. The implementation of the recycled water program has been delayed because development has not occurred as expected due to the poor economy. Furthermore, the Tesla Power Project that was projected to need recycled water by 2010 is not going to be constructed. Since the 2005 UWMP, the City has constructed tertiary treatment facilities to produce recycled water. As the economy improves and development begins, the City expects to start distributing recycled water to the new developments and within the City.

4.9.4.4 Actions to Encourage Recycled Water Use

10633 (f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

As described above, the City has taken numerous steps to encourage the use of recycled water within and around Tracy. In accordance with the City's 2002 Recycled and Non-Potable Water Ordinance (see Appendix J), new developments are required to install pipelines and dual distribution systems to supply recycled or non-potable water to landscaped areas for irrigation and to facilities for industrial cooling or processing. The City's Water Exchange Program is designed to convert existing City parks and other large irrigated areas to non-potable water as opportunities arise.

Tracy does not have plans to provide financial incentives to encourage the use of recycled water because the City is not currently serving recycled water to its customers. However, financial

incentives to encourage the use of recycled water will be addressed as part of a future policy decision if and when the City decides to serve recycled water to its customers.

4.9.4.5 Plan to Optimize Recycled Water Use

10633 (g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

Tracy wishes to increase its future use of recycled/non-potable water. The City's coordination with proposed developments and the City's Recycled and Non-Potable Water Ordinance encourage the use of recycled water. The City has been closely involved with future development, and remains committed to working toward significant water recycling in the future.

5. RELIABILITY OF SUPPLY

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:
(1) An average water year.
(2) A single-dry water year.
(3) Multiple-dry water years.
For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

The reliability of each DMC/CVP water supply was originally estimated based on the USBR PROSIM model, and more recently the CALSIM II model, potential restrictions to Delta pumping, and impacts from climate change. The model projects annual delivery quantities from the CVP taking into consideration historical hydrologic conditions, environmental restrictions and regulatory constraints, and Delta improvements over a 71-year period (1922-1993) [25] For the purposes of the UWMP, and to be consistent with the Draft Citywide Water System Master Plan, these reliability estimates have been adjusted to provide a slightly more conservative estimate of the available supplies during normal hydrologic conditions, to account for additional potential Delta pumping restrictions and/or climate change impacts. While these more conservative water supply estimates are being used at this time, the supply estimates will be reviewed at least every five years during the UWMP update process, and will be subject to change, (either up or down), depending on the actual conditions that have occurred between UWMP updates, and those that are occurring at the time of the revised supply estimate (WYA, 2011). Based on these assumptions, during an average hydrologic year, Tracy can expect to receive approximately 75% of its M&I-reliability water supply and 50% of its Ag-reliability water from the USBR's allotment of CVP water via the DMC (plus the small volume of BBID water that is managed through Tracy's treatment and distribution system on behalf of Patterson Pass Business Park).

During droughts, cutbacks on Tracy's DMC/CVP supply are projected to occur. When CVP/DMC supplies are thus reduced, Tracy can increase its use of SCWSP water and local groundwater. The availability of groundwater is considered to be less dependent on climatic factors and is available. In addition, the City plans to further increase the reliability of its water supply during drought years through the purchase of capacity in the Semitropic water bank and potential future implementation of an ASR program (see Section 4.5).

During a single-dry year, or when the DMC/CVP flows must be reduced due to environmental impacts, Tracy's Bureau surface water allotments are subject to reduction. The actual reductions will vary with the severity of the regional water supply shortage (Tracy holds both M&I- and Ag-reliability contracts to DMC/CVP water). The contractual conditions for M&I- and Ag-reliability DMC/CVP water and the potential for reductions are outlined in Appendix D. For the purposes of this 2011 UWMP, it was assumed that Tracy would receive approximately 95% of its SCWSP water supply, 90% of its pre-1914 water rights water, 65% of its M&I-reliability water supply, and

[25] Draft Water System Master Plan, Chapter 5, (WYA, 2011).

15% of its Ag-reliability water from the USBR's allotment of DMC/CVP water during a single dry year.[26]

If there are successive dry years, Tracy's surface water allotments, especially from the DMC/CVP, may be significantly reduced. Thus, in the event of drought, Tracy will have to depend more heavily on conservation efforts, groundwater, SCWSP supplies, and Semitropic supplies.

As an example, in 1991, due to prolonged drought, the USBR reduced Tracy's DMC/CVP surface water allotment by 50%, such that Tracy's 1991 allocation was reduced to 5,000 ac-ft. As a result, Tracy implemented a water conservation program consistent with its Water Shortage Contingency Plan included as Appendix L, and relied on its groundwater supply to satisfy a larger portion of the water demand. Tracy now has a broader portfolio of water supplies. For the purposes of this UWMP, it was assumed that Tracy would receive approximately 95% of its SCWSP water supply, 90% of its pre-1914 water rights water, 40% of its M&I-reliability water supply, and 10% of its Ag-reliability water from the USBR's allotment of DMC/CVP water during a multiple-dry year period.[27]

The reliability of each of Tracy's existing and future water supplies and their projected availability during normal, single-dry, and multiple-dry years is described below and summarized in Tables 18 through 20.

5.1 NORMAL YEAR

Normal or wet water years are those water years that match or exceed median rainfall and runoff levels. The reliability of each of Tracy's existing and future water supplies and their projected availability during normal and wet years is outlined below and in Table 18.

- The Tracy Contract for an annual entitlement of 10,000 ac-ft of USBR water from the DMC/CVP is subject to M&I Reliability. Based on the historical record, Tracy's long-term average allocation of DMC/CVP water pursuant to this contract is anticipated to be at least 85% of the total entitlement. However, for this UWMP, due to recent environmental concerns in the Delta and potential future impacts due to climate change, the percentage has been reduced to 75 percent. Therefore, for projection purposes in this UWMP, it has been assumed that Tracy will receive 75% of its entitlement during normal water years, or 7,500 ac-ft per year.
- Tracy has been assigned contracts (BCID and WSID) for an annual entitlement of up to 7,500 ac-ft per year of USBR water from the DMC/CVP. Tracy also holds an option to purchase an additional 2,500 acre-feet per year of DMC/CVP contract entitlement from WSID. These contracts are subject to Ag-reliability. Tracy is conservatively estimating that it will receive 50% of its Ag-reliability contractual entitlement in future normal water years, or a total of 3,750 ac-ft (0.50 x 7,500) per year prior to 2014 and 5,000 ac-ft (0.50 x 10,000 ac-ft) per year after 2014.

[26] The reliability assumptions set forth in this plan are for planning purposes, and do not alter Tracy's contractual or other legal rights.

[27] Based on average deliveries of CVP water during historic drought periods (1929-1934 and 1987-1992) (WYA, 2002). These supply reliability estimates will be reevaluated in the next UWMP update and could be adjusted, based on any issues that occur between now and the next update publication

- During a normal water year, Tracy expects to receive 100% of its SCWSP water supply allocation, or 10,000 ac-ft per year.
- Pursuant to the Groundwater Management Policy, Tracy can extract up to 9,000 ac-ft per year of local groundwater (Navigant, 2001). Because of the high TDS and hardness of Tracy's groundwater, the City hopes to reduce its dependency on groundwater in the future. As additional higher quality water supplies come on line, Tracy estimates that it may be possible to reduce the quantity of groundwater used during a typical normal or wet year. This reduction however, is highly dependent on future water supplies and demands and should be viewed as a goal, and not a firm projection. In the event that additional supplies are needed, Tracy may utilize up 9,000 ac-ft of groundwater per year.
- By 2015, up to 3,000 ac-ft per year of pre-1914 appropriative water rights water is expected to be available for purchase from BBID. After 2015, Tracy anticipates being able to receive 100% of this supply during normal and wet years.
- By 2030, up to approximately 11,000 ac-ft per year of Ag-reliability water from BBID DMC/CVP contract is expected to be available to Tracy.[28] Therefore, in future normal water years, as much as 5,500 ac-ft per year (0.50 x 11,000 ac-ft) will be available.
- By 2015, Tracy expects to receive 100% of its additional SCWSP water supply allocation, or 3,000 ac-ft per year.

5.2 SINGLE-DRY YEAR

A single-dry year is generally considered to be the lowest annual runoff for a watershed recorded since the 1903-04 water year. The reliability of each of Tracy's existing and future water supplies and their projected availability during a single-dry year are outlined below and in Table 19.

- The Tracy Contract for an annual entitlement of 10,000 ac-ft of USBR water from the DMC/CVP is subject to M&I Reliability. Based on the historical record, Tracy's annual allocation will be 75% of its entitlement, however, to be slightly more conservative to account for possible additional environmental concerns through the Delta and potential future climate change impacts, the allocation is assumed to be 65 percent, or 6,500 ac-ft for consistency with the City's Draft Water System Master Plan.
- Tracy holds the assignment contracts (BCID and WSID) for an annual entitlement of up to 7,500 ac-ft per year prior to 2014 and 10,000 ac-ft per year after 2014. These contracts pertain to USBR water from the DMC/CVP and are subject to Ag-reliability. To be slightly more conservative as explained previously, 15 percent of the allocation is assumed, or 1,125 ac-ft per year prior to 2014 and 1,500 ac-ft per year after 2014.
- During a single-dry year, it is assumed that Tracy will receive 95% of its SCWSP water supply allocation, or 9,500 ac-ft per year.
- Pursuant to the Groundwater Management Policy, Tracy can extract up to 9,000 ac-ft per year of local groundwater resources (Navigant, 2001). However, as described above, Tracy may reduce its future groundwater use to 2,500 ac-ft per year by 2015. In the event

[28] As described in Section 4.5.1.2, the exact quantity of BBID CVP water entitlement is the subject of a future agreement, it may be acquired in increments, if at all, and the exact quantity has not yet been determined.

that groundwater is needed to supplement surface water supplies during a single-dry year however, the City does intend to call on these supplies up to the maximum sustainable yield of 9,000 ac-ft per year.

- By 2015, up to 3,000 ac-ft per year of pre-1914 appropriative water rights water is expected to be available from BBID. In single-dry water years after 2014, it is assumed that 2,700 ac-ft per year of BBID Pre-1914 water right water, or 90% of the contractual allocation, will be available.
- By 2030, up to 11,000 ac-ft per year of Ag-reliability water from the BBID DMC/CVP contract is expected to be available to Tracy. In future single-dry water years, it is assumed that as much as 1,650 ac-ft per year, or 15% of the contractual entitlement, of BBID water will be available.
- By 2015, it is assumed that Tracy will receive 95% of its additional SCWSP water supply allocation, or 2,850 ac-ft per year.
- By 2015, 3,000 ac-ft per year of banked water is assumed to be available through Tracy's ASR program and by 2015, approximately 3,500 ac-ft per year of banked water through the Semitropic water bank.[29]

5.3 MULTIPLE-DRY YEAR PERIOD

A multiple-dry year period is generally considered to be the lowest average runoff recorded for a consecutive multiple year period (three years or more) for a watershed since 1903. For example, 1928-1934 and 1987-1992 were the two multi-year periods of lowest average runoff during the 20th Century in the Central Valley Basin. The reliability of each of Tracy's existing and future water supplies and their projected availability during a multiple-dry year period are outlined below and in Table 20.

- The Tracy Contract for an annual entitlement of 10,000 ac-ft per year of USBR water from the DMC/CVP is subject to M&I Reliability. Based on the historical record, Tracy's annual allocation will be 50% of its entitlement, however, for purposes of this UWMP update to be consistent with the City's Draft Water System Master Plan and be slightly more conservative, 40 percent of the supply allocation is assumed, or 4,000 ac-ft per year.
- Tracy holds the BCID and WSID Contracts for an annual entitlement of up to 7,500 ac-ft per year prior to 2014 and 10,000 ac-ft per year after 2014. These contracts, which cover USBR water from the DMC/CVP, are subject to Ag-reliability. Based on the historical record and to be slightly more conservative a planning value of 10 percent of the allocation is assumed, equivalent to 750 ac-ft per year prior to 2014 and 1,000 ac-ft per year after 2014.
- During a multiple-dry year period, Tracy expects to receive 95% of its SCWSP water supply allocation, or 9,500 ac-ft per year.
- Pursuant to the Groundwater Management Policy, Tracy can extract up to 9,000 ac-ft per year of local groundwater resources (Navigant, 2001). However, as described above,

[29] Tracy's ASR program proposes to inject treated drinking water during years of excess deliveries. This water would then be pumped out of the aquifer as needed in future years. Water banked with Semitropic however, would be pulled directly out of the DMC and replenished back to the DMC by Semitropic, per the Agreement.

Tracy may reduce its future groundwater use to 2,500 ac-ft per year by 2015. In the event that groundwater is needed to supplement surface water supplies during a multiple-dry year period however, the City does intend to call on these supplies up to the maximum sustainable yield of 9,000 ac-ft per year.

- By 2015, up to 3,000 ac-ft per year of pre-1914 appropriative water rights water is expected to be available for purchase from BBID. In multiple-dry water years after 2014, it is assumed that 2,700 ac-ft per year of BBID Pre-1914 water right water, or 90% of the contractual allocation, will be available.
- By 2030, up to 11,000 ac-ft per year of Ag-reliability water from BBID DMC/CVP contract is expected to be available to Tracy. In future multiple-dry water years, it is assumed that as much as 1,100 ac-ft per year of BBID DMC/CVP water, or 10% of the contractual entitlement, will be available.[30]
- It is assumed that Tracy will receive 95% of its future SCWSP water supply allocation, or 2,850 ac-ft per year.
- By 2015, up to 3,000 ac-ft per year of banked water is assumed to be available through Tracy's ASR program and approximately 3,500 ac-ft per year for three consecutive years of banked water (10,500 ac-ft over a three-year period) is anticipated to be available through Semitropic.

5.4 WATER QUALITY IMPACTS ON RELIABILITY

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

The potable water that Tracy delivers to its customers complies with all state and federal drinking water requirements. Appendix M contains the Tracy 2009 Water Quality Report that summarizes water quality for both the DMC/CVP and SSJID water (City of Tracy, 2009). There are occasional aesthetic concerns with Tracy's water supply because the groundwater is heavily mineralized and the DMC/CVP water periodically has taste and odor problems resulting from algae blooms in the Delta. The high-quality SSJID water introduced in 2005 has improved the aesthetic quality for Tracy's water customers. If Tracy is able to develop its ASR program as proposed, the aesthetic quality of the extracted groundwater may also improve in the future.

Water quality is expected to be similar for 2010, 2015, 2020, 2025, 2030 and 2035. Specific information related to the quality of each of Tracy's surface water and groundwater sources is provided below.

5.4.1 DMC/CVP Water Quality

A sanitary survey for the drinking water sources for Tracy's potable water system was completed in Fall 2010 (EKI, 2010). The sources that were found to be most vulnerable to airport maintenance and fueling areas, gas stations (historical and existing), mining (active and historical),

[30] West Yost Associates, Draft Water System Master Plan, Chapter 5, April 2011 (WYA, 2011).

and septic and waste landfill dumps (historical and existing).[31] While significant problems have not been encountered to date, there is also potential for a variety of water quality issues in the Delta that could make the water less suitable for municipal use. Potential issues include levee failures, toxic spills, and salinity.

As discussed in Section 4.5.1.1, an intertie between the DMC and the State Water Project ("SWP") California Aqueduct is being constructed. A previous City study, as discussed in the 2005 UWMP, has shown that both the DMC and the SWP have highly variable and similar water quality; therefore, no major change in water quality is expected. Further, as described above, the high quality SCWSP water enhances water quality in Tracy, and provides a redundant supply of water in the event that the quality of another one of the surface water sources, such as the DMC, is degraded.

5.4.2 Stanislaus River Water Quality

Available raw water quality data are summarized and analyzed in the SSJID 2005 Survey Update. A summary of raw water quality data collected from January 1998 through July 2004 is presented in Appendix N (Table 8.1) (Black & Veatch, 2005).

In general, the water quality of SSJID surface water is better than that of the DMC. Turbidity within the SSJID water supply averaged at 4.9 NTU, while the levels in the DMC water supply in the summer of 2010 were at 12 NTU. Of the parameters monitored and reported in the SSJID 2005 Survey Update, almost all of the compounds were detected at concentrations below applicable water quality standards.

Results from the SSJID's 2005 Sanitary Survey indicate that cattle in the vicinity of the main canal are likely contributing to elevated levels of total and fecal coliform between the Goodwin Dam and the Woodward Reservoir, and that recreational activity near the reservoir may be causing additional contamination. To prevent access to the canal and watershed, SSJID fixed the fencing along the canal since the 2005 SSJID Sanitary Survey. SSJID is currently updating the Sanitary Survey.

5.4.3 Groundwater Quality

Generally, the City's groundwater has high levels of TDS and sulfate and very high hardness. Therefore, the City is managing its water sources conjunctively to preferentially use its higher quality, surface sources and minimize its dependence on local groundwater, which has lower quality compared with available surface sources. Additional information related to groundwater quality is presented as part of the bi-annual groundwater monitoring that the City conducts as part of the Mitigation Monitoring Program pursuant to the City's *Groundwater Management Policy Mitigated Negative Declaration.*

Groundwater quality data collected to date is summarized in Appendix I and in the following sections. Unless otherwise noted, the information presented below is from GEI (2009).

[31] http://www.ci.tracy.ca.us/departments/public_works/water_quality/

5.4.3.1 Production Wells

According to GEI (2009), none of the water quality parameters from the production wells exceed California Primary Drinking Water Standards (also called MCLs). TDS, specific conductance (measured by the water's electrical current, or "EC"), and sulfate have consistently been measured at levels above the California Secondary Recommended MCLs. Other constituents, such as nitrate, arsenic, chromium, boron, and chloride, are present in Tracy's groundwater at levels that are elevated but in compliance with MCLs.

5.4.3.2 Monitoring Wells

Similarly to the data collected from production wells, none of the water quality parameters from Tracy's monitoring wells exceeded California Primary MCLs. Several monitoring wells have concentrations of TDS, EC, chloride, sulfate, iron, and manganese that exceeded California Secondary Recommended MCLs. Generally, groundwater quality appears to be better in the Zone A aquifer (the shallow aquifer located directly beneath the Corcoran Clay) than in the deeper zones, with the exception of arsenic. The poorest quality water is present at monitoring well MW-5C, screened in the deep aquifer, where the TDS exceeds 1,000 mg/L. Patterns of groundwater extraction by Tracy do not appear to be negatively impacting groundwater quality (GEI, 2009).

5.5 WATER SHORTAGE CONTINGENCY PLAN

10632. The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier: (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

Tracy established its Water Shortage Contingency Plan ("WSCP") in 1992, following a period of severe drought, to provide City staff and City water customers with guidelines for reducing water consumption in the event of another drought (Appendix L). Tracy's WSCP includes an analysis of existing and projected water demands and supplies, a water conservation and rationing plan with mandatory prohibitions and penalties, and an analysis of projected revenues and expenditures.

The WSCP was incorporated into the Water Management Chapter of the TMC as codified in Chapter 11.28, Article 5 - Drought and Other Water Emergency, and Article 6 - Water Conservation and Rationing Plan, Water Emergency Plan, Variances and Appeals ("WCRP"). The WCRP sections of the TMC since been amended to incorporate changes in rate schedules, penalties, among others. Because the WCRP sections of the TMC incorporate the amendments to the WSCP, for the purposes of this UWMP, all water conservation and water emergency/drought mandates reference the WCRP sections of the TMC rather than the WSCP.

Tracy's WCRP includes provisions for five Stages of Action (referred to as "Phases" in the TMC and as "Stages" in this UWMP). The following sections describe the measures to be taken in each of the five Stages, the prohibitions, penalties, and consumption reduction methods for each stage, and enforcement mechanisms for ensuring that the desired cutbacks are achieved.

Implementation of the WCRP can be triggered by four different scenarios: (1) decline of groundwater basin level to 30 feet below sea level; (2) cutback of CVP water supplies; (3) drought declaration by the Governor of California; and (4) any unusual situation that affects the quantity or quality of the City's water supply. In the event that any of the aforementioned triggers occur, the City Council is granted the authority to declare a drought and direct the City Manager to implement the WCRP. Transitions between the conservation phases outlined in the WCRP are implemented by resolution of the City Council.

5.5.1 Stages of Action

10632. The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier: (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

The five Stages of Action ("Stages") outlined in the City's WCRP (TMC 11.28. Article 6) are intended to promote the proper management and distribution of water supplies during a drought or emergency situation. Each of the five Stages describes specific actions to be taken by individual water customer sectors to achieve the water conservation requirement of that particular Stage. All of the Stages allow for adequate water to protect public health and safety and satisfy the fire protection needs of the City.

Each of the five Stages corresponds to a specific City-wide potable water demand reduction goal. These potable water demand reduction goals are based on the City's potential supply cutbacks during times of drought, with up to a 50% supply reduction as mandated by the UWMP Act. The five Stages and their associated cutbacks are described in Table 21.

The first Stage, Stage I, represents a potable water demand reduction goal of less than 10%. Stage I reflects a scenario where the City may maintain sufficient supplies to meet normal year potable water demands, but calls for voluntary reductions in water use to help alleviate potential impacts of more severe supply reductions in subsequent years. Stage I prohibits flagrant water waste, mandates swimming pool covers and proper maintenance of plumbing and irrigation systems, and encourages the use prudent water conservation measures for landscapes. These actions are listed in Table 21.

The actions outlined in Stage II are to be implemented when the City requires a 10% reduction in potable water demand during dry year periods. Stage II calls for landscape irrigation and outdoor water use conservation measures, including the development of a landscape irrigation schedule for single-family residences, and restrictions on non-essential water uses such as sidewalk washing and car washing, and the addition of water above operational requirements for pools and hot tubs (Table 21).

Stage III water conservation and rationing measures are geared toward a 15% reduction in City-wide potable water demand. The steps to achieve a Stage III reduction include all of the steps outlined in Stage II, as well as the additional mandates described in Table 21. A 15% reduction in potable water demand should be achievable through increased restrictions on landscape irrigation

and non-essential water uses, as well as increased emphasis on implementation of a public information campaign.

The fourth WCRP Stage, Stage IV, includes the actions outlined above in Stages I through III combined with additional restrictions necessary to achieve a 25% reduction in potable water demand within the City. These restrictions target non-essential water uses by commercial facilities and industries. Measures would include car washing practices for auto dealerships and additional public information notices in commercial businesses.

Stage V identifies mechanisms by which the City can reduce total potable water demand by more than 25% (with up to a 50% cutback for the purposes of this UWMP). To achieve a reduction in potable water demand exceeding 25%, the City would prohibit all water use except as required for public health and safety (50 gallons per capita per day). Reductions in Stage V would include a 100% cutback in recreation and irrigation water use.

Street cleaning with potable water was not specifically referenced in the WCRP. However, Tracy uses a dry street sweeping technique that does not use water.[32] In the next update of the WCRP, street cleaning with potable water will be prohibited.

5.5.2 Estimate of Minimum Supply for Next Three Years

10632 (b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

Tracy's estimate of the minimum water supply available during the next three years is conservatively assumed to be equal to the quantity of water that Tracy can expect to receive during a multiple-dry year period. It is estimated that the City's minimum supply for the next three years (2011 to 2014) will be 23,250 ac-ft per year, which is more water than the City's 2010 total potable water demand of 16,600 ac-ft per year.

5.5.3 Catastrophic Supply Interruption Plan

10632(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

In response to the requirements of the Public Health, Security and Bioterrorism Preparedness and Response Act of 2002 ("Bioterrorism Act"), Section 1433 amendment to the Safe Drinking water Act, Tracy has prepared a Water System Emergency Response Plan ("WSERP") (WYA, 2004). The City's WSERP provides a framework for emergency response by the City's Public Works Department ("Department") by describing the Department's emergency management organization, roles, and responsibilities and emergency policies and procedures. Excerpts from Tracy's WSERP can be found in Appendix O. In accordance with the aforementioned goals, the WSERP:

- Describes the Departments' emergency management organization;

[32] From personal communication with Steve Bayley on 7 March 2011.

- Identifies of the types of emergencies that the Department may need to respond to for its water system;
- Outlines the roles and responsibilities the Department and its staff during emergency response and recover; and
- Compiles and organizes water system emergency response protocols and procedures.

Prior to the 2003 WSERP, the City had developed numerous emergency planning and procedures documents which provide information on emergency roles and responsibilities and specific emergency procedures for the City's water supply and distribution facilities. Tracy's 2003 WSERP is not intended to replace these documents, but is designed to work in conjunction with existing plans. Additional water supply emergency plans adopted by the City include:

- *City of Tracy Emergency Plan*;
- *Emergency Response Handbook*;
- *City of Tracy General Standby Procedures*;
- *Process Safety Management Program*;
- *Emergency Action Plan*;
- *Department of Health Services Water Quality Emergency Notification Plan*;
- *Water Treatment Plant Operations Manual*;
- *Water Treatment Plant Operations Plan*;
- *Risk Management Plan*; and
- *Hazardous Materials Business Plan*.

A more complete description of these plans can be found in the WSERP.

5.5.3.1 Types of Emergencies

Several types of emergencies can occur which could impact the City's water system and its operations. Tracy's WSERP is designed to assist the City in quick response to water system emergencies that may include the following natural or man-made causes:

- Earthquake
- Fires
- Contamination or loss of water supply
- Hazardous materials spills or leaks
- Severe storms or floods
- Landslides
- Pipelines, reservoir, tank and/or building failure
- Civil unrest, vandalism, or terrorist action or threat
- National security emergency
- Widespread power outage
- Airplane crash
- Traffic/highway accidents
- Intrusion through Supervisory Control and Data Acquisition system

It is important to note that there are a number of events, such as large earthquakes or fires, which occur infrequently, but have a very high impact potential. There are also events, such as severe

storms and floods, which have less of an impact potential, but occur more frequently. Although the planning basis for Tracy's WSERP is for a major emergency, the principles outline in the WSERP can be applied to any type or magnitude of event.

5.5.3.2 Emergency Categories and Response Levels

Four response categories have been defined in the WSERP to provide a common method of describing the type of event, area affected, and the extent of coordination or assistance needed. These categories include (0) Readiness/Routine Response, (1) Local Emergency, (2) Local Disaster, and (3) Major Disaster (see Table 6, Appendix O).

Depending on the severity of a given emergency, the situation may warrant response from different levels of government consistent with the Standardized Emergency Management System ("SEMS"). Tracy's WSERP identifies these levels as State, Regional, Operational Area (San Joaquin County), Local (City of Tracy), or Field (Public Works Staff). The extent of each levels' responsibilities is described in Figure 1 of Appendix O and their involvement in each of the four emergency response categories are outlined in Table 6 of Appendix O.

5.5.3.3 Plan Activation, Response, and Deactivation

Table 9 in Appendix O gives the response categories, triggers and potential response actions to be implemented to the extent required by the nature and scope of the emergency. The activation process includes plan triggers, staff responsibilities, mutual aid or assistance availability and damage assessment. Responses are coordinated in accordance with the severity and extent of the emergency.

Table 10 of Appendix O identifies deactivation triggers and potential actions to be implemented once the emergency situation has been corrected and water quality is established. The deactivation process is in the reverse order of the activation process, starting with the highest category attained in the activation process.

5.5.4 Consumption Reduction Methods, Prohibitions, and Penalties

10632 (d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning. (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply. (f) Penalties or charges for excessive use, where applicable.

5.5.4.1 Consumption Reduction Methods and Prohibitions

Consumption reduction methods and prohibitions for the five Stages of Action described in Tracy's Water Conservation and Rationing Plan are described above and in Table 21. During Stage V, the most restrictive Stage, the City intends to reduce water use by prohibiting the following actions:

- No recreational water use allowed
- No irrigation water use allowed

- All water uses not required for public health and safety and fire protection are prohibited
- Notices of drought conditions posted in all facilities with restrooms
- No potable water used for street cleaning

Prohibitions against specific water use practices for Stages I through IV are outlined in Table 21 and in the WCRP (see Appendix L). Specific restrictions for each Stage of Action are outlined in the WCRP, including those restrictions applying to irrigation using potable water, car washing, filling swimming pools, and building new developments during droughts. Practices such as using potable water for construction purposes are also prohibited when the City is required to cutback water use significantly.

5.5.4.2 Penalties

In accordance with TMC 11.28.070, a customer who violates any of the provisions of Stage I through Stage V of Tracy's WCRP, or fails to comply with an order or permit made thereunder, is guilty of an infraction. Under Section 1.04.030 of the TMC, an infraction is punishable by:

(1) A fine not exceeding $100 for a first violation.
(2) A fine not exceeding $200 for a second violation within a twelve month period.
(3) A fine not exceeding $500 for each additional violation of within a twelve month period.
(4) If a person is found to have violated the same Code provision at least twice within a twelve month period, the offense, which would otherwise be an infraction, is considered a misdemeanor.[33]

Additional actions that are penalized in TMC Section 11.28.070 include the unauthorized drawing of water from a fire hydrant, the drawing from a fire hydrant for construction purposes after receiving notice that reclaimed water is available and required, or the construction of a bypass around a water meter. Such actions are subject to a $500 fine.

Four violations within the same six month period will result in the installation of a meter service flow restrictor at the customer's expense. The flow restrictor is to remain in place for the remainder of the drought or water emergency. Failure to pay assessed fines will result in termination of water service until payment in full of all fines and usual reconnection charges are collected from the customer.

5.5.5 Analysis of Revenue Impacts of Reduced Sales During Shortages

10632 (g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

Since Tracy bills its customers per unit volume of water consumed, the City would experience a reduction in revenue upon implementation of the Water Conservation and Rationing Plan. As described in Section 6.1.11, to compensate for the expected revenue reduction cause by water

[33] A misdemeanor is punishable by a fine not exceeding $1,000, or imprisonment not exceeding six months, or both. (Ord. 996 § 1 (part), 1999)

conservation, the City Council reserves the authority to adopt a temporary rate increase and institute an excess water surcharge (TMC 11.28.220 and 11.28.230).

5.5.6 Draft Ordinance and Use Monitoring Procedure

10632 (h) A draft water shortage contingency resolution or ordinance.
10632 (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

A copy of the City's Water Shortage Contingency Plan, its Water Conservation and Rationing Plan, and the associated Articles 5 and 6 of Tracy's Municipal Code ("TMC") Chapter 11.28 (see Appendix L). To determine the actual reduction in water use during water shortage periods, the City plans to increase the frequency at which it conducts meter readings to ensure that customers are conserving water. By frequently monitoring water use at its residential and CII accounts, the City will ensure compliance with water shortage rationing and be able to impose penalties on those who are not complying with the Water Conservation and Rationing Plan or the Stage of Action being enforced. Non-compliance with the required water conservation will result in the penalties described in Section 6.1.13, potentially including fines, flow restriction devices, and termination of service.

5.6 WATER SUPPLY VS. DEMAND

10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple-dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single-dry water year, and multiple-dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

As discussed previously, Tracy's water demand projections and the volume and reliability of its water supplies are expected to vary as a function of time and hydrologic conditions. The following sections compare Tracy's projected potable water supplies and demands for years with normal and less than normal precipitation over a period of 20 years. Based on Tracy's water supply projections described in Section 4 and the potable water demand projections explained in Section 3, the City is projected to have sufficient potable water supplies to meet all of its projected demands through the year 2035 during years of normal precipitation (see Table 22) This projection is based on the assumptions described in Section 4. These assumptions include Tracy's ability to secure and utilize its options to purchase the additional WSID and BBID DMC/CVP and Pre-1914 appropriative water, additional water from SSJID, and some reduction of groundwater extraction to as little as 2,500 ac-ft per year by 2015.

5.6.1 Projected Single-Dry-Year Supply and Demand Comparison

As listed in Table 23, comparison of Tracy's single-dry year water supply projections to its water demand projections indicates that the City will likely have sufficient water supplies to meet projected potable water demands through 2020 using the City's existing and expected available

supplies listed in Section 4 and shown in Table 12. It is important to note that this analysis assumes that Tracy has acquired the additional WSID and BBID DMC/CVP and Pre-1914 water rights described in Section 4, additional SSJID water, and has reduced its groundwater use.

5.6.2 Projected Multiple-Dry-Year Supply and Demand Comparison

As listed in Table 24, comparison of Tracy's multiple-dry year water supply projections with projected water demands indicates that the City will likely have sufficient water supplies to meet projected potable water demands through 2025 using the City's existing and expected available supplies listed in Section 4 and shown in Table 12, but will encounter supply shortfalls of up to 14% by 2035. It is important to note that this analysis assumes that Tracy has acquired the additional WSID and BBID DMC/CVP and Pre-1914 water rights described in Section 4, and additional SSJID water and has reduced its groundwater use. The City may be able to achieve such cutbacks in demand through implementation of its Water Shortage Contingency Plan, but such cutbacks would likely have significant impacts on the City's economy, among other negative impacts.

It is anticipated that Tracy could make up this shortfall in supply if it were able to purchase water on the spot market or if Tracy could draw upon additional water supplies it had banked for drought supply purposes.

Tracy is working to develop two water banking programs. First, additional drought water supply could come from potable water that is stored in the aquifer beneath Tracy as a result of implementation of an ASR program. Under the second program, Tracy would purchase space in the Semitropic Water Bank to store water for use during times of drought (see Table 12). If Tracy is able to implement these two water banking programs, the City should have sufficient water supplies to meet demand during a multiple-dry year period. Another option the City retains is to use groundwater to make up any shortfall.

6. DEMAND MANAGEMENT MEASURES

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

- *A) Water Surveys for Single-Family and Multi-Family Residential Customers*
- *B) Residential Plumbing Retrofit*
- *C) System Water Audits, Leak Detection, and Repair*
- *D) Metering*
- *E) Large Landscape Conservation Program and Incentives*
- *F) High-Efficiency Appliance Promotion Programs*
- *G) Public Information Programs*
- *H) School Education Programs*
- *I) Conservation Programs for Commercial, Industrial, Institutional Customers*
- *J) Wholesale Agency Assistance Programs*
- *K) Non-Promotional Water Pricing Programs*
- *L) Water Conservation Coordinator*
- *M) Waste Water Prohibition*
- *N) Residential Ultra Low Flush Toilet Replacement*

In accordance with the Reclamation Reform Act of 1982 ("RRA"), the City prepared a draft Water Management Plan to the USBR in 2009. The RRA states that all parties that contract with the USBR for M&I water supplies greater than 2,000 ac-ft per year, or Agricultural water supplies that cover over 2,000 irrigable acres, are required to prepare and submit Water Conservation Plans to the USBR every five years. As described in Section 4, the City holds multiple contracts with the USBR in excess of these quantities.

Tracy's Water Conservation Plan includes, among other items, a copy of the City's water-related ordinances and City Code sections, an inventory of the City's water resources and quality, and a description of the City's water conservation efforts. These conservation efforts include implementation of the California Urban Water Conservation Council's ("CUWCC") 14 Best Management Practices ("BMPs").

As described in Tracy's Water Conservation Plan, Tracy is committed to water conservation and efficient use of water. The City has implemented the majority of the 14 CUWCC BMPs, which are equivalent to the "Demand Management Measures", or "DMMs", defined in the UWMP Act. For the purposes of this 2011 UWMP, we refer to the UWMP Act Demand Management Measures as DMMs. The DMMs are described below and in Table 25.

6.1 DEMAND MANAGEMENT MEASURES

Tracy's 2005 UWMP was reviewed during the preparation of the 2011 UWMP. The following sections summarize actions taken by the City's Water Conservation Coordinator to encourage water conservation pursuant to each of the 14 DMMs since the 2005 UWMP. DMM actions are

described by fiscal year ("FY"); for example, "FY 2010-11" refers to the period July 1, 2010 through June 30, 2011.

6.1.1 DMM 1 - Residential Water Surveys

The City's residential survey program focuses on personal visits from the City's Water Conservation Coordinator ("WCC") to identify leaks and offer water- saving ideas. Tracy offers its residential survey program free-of-charge to its single-family and multi-family water customers. Customers who participate in the residential survey program may receive free water-saving information and equipment, including low-flow showerheads and faucet aerators. During a residential survey, the WCC also evaluates the customer's landscape and irrigation systems and furnishes suggestions for conservation.

The City's WUDS software program can identify the top 20% of the single-family or multi-family users and target them for conservation evaluations. The software program also allows the City to include information on customer bills regarding general and customer-specific water use trends. Advertisement for Tracy's residential surveys is also done through utility bill inserts and community events such as the Bean Festival, which attracts over 88,000 visitors over two days each September.

The amount of money spent on residential water surveys for each fiscal year is listed in Table 25. Fourteen surveys have been completed since 2005. The City will continue to perform residential surveys for its customers. The water savings from the implementation of this DMM are not quantified.

6.1.2 DMM 2 - Residential Retrofits

The City distributes water conservation kits to customers upon request. Kits contain low-flow showerheads, faucet aerators, dye tablets for toilet tank leak detection, and water bags for toilet tank displacement. Since FY 2005-06, four retrofit kits have been distributed. The amount of money spent on residential retrofit efforts is listed in Table 25.

The number of pre-1992 single-family accounts and multifamily accounts is not available. Therefore, the City is unable to estimate the saturation rate of faucet aerators and showerheads retrofits. The City will continue to distribute retrofit kits as requested. The water savings from the implementation of this DMM are not quantified.

6.1.3 DMM 3 - System Water Audits and Leak Detection

Citywide water consumption is tracked through the use of the WUDS software. Consumption is compared to potable water purchases and groundwater production to determine the unaccounted for water. The City's goal is to maintain less than 10 percent of unaccounted for water within the total potable water supply. Tracy's UAW is consistently below 10%; therefore, Tracy has not conducted a system-wide leak detection survey since 1999. Tracy also conducts routine maintenance of its water lines and promptly repairs any ruptured water lines. The water savings from implementation of this DMM are not quantified.

6.1.4 DMM 4 – Metering

As of December 2010, Tracy meters all 23,449 customers with radio-capable meters. The ability to perform meter readings remotely via radio will enhance data acquisition. Such radio-capable meters can alert customers or the City when there is a leak, potentially reducing wasted water.

The City charges its customers a base service rate depending on meter size. Meter service charges range from $11.70 per month for a 5/8-inch or 3/4-inch diameter meter, to $2,070.40 for a 10-inch meter. Table 26 gives the full range of service charges based on meter size.

Water is billed using Tracy's tiered rate structure. The City bills customers based on the volume of water consumed, in units of one hundred cubic feet (748 gallons). For more information on Tracy's rate schedule, see DMM 11, Section 6.1.11. The water savings from implementation of this DMM are not quantified.

6.1.5 DMM 5 - Landscape

As of 1 January 2010, the State Model Water Efficient Landscape Ordinance is being enforced by the City as required by State law. However, the City is also working to develop its own ordinance for water efficient landscaping in accordance with the requirements established by the State. It anticipated the City's ordinance will be adopted in the near future. Compliance with the ordinance is overseen by the City Planning Department.

The City began conducting landscape audits in 2008-09 on an as requested basis. The City also offers landscape audits based on high water users identified in the billing system. Approximately 3 audits were completed in both 2008-09 and 2009-10.

6.1.6 DMM 6 - High-Efficiency Clothes Washing Machine

The City offers a high-efficiency clothes washing machine ("HECW") rebate program to single-family and multi-family residents. The City extends a $50 rebate for Energy Star-rated, HECWs.[34] This voucher program may be used jointly with PG&E's rebate programs. This rebate is valid for new HECWs listed in the Qualifying Product list published by the Consortium for Energy Efficiency.[35]

Tracy offers the HECW rebate program on a first come, first served basis, budgeting up to $10,000 in rebates per fiscal year. From fiscal year 2005-06 through 2009-10 all available washing machine rebates were exhausted, as listed in Table 25. The City intends to continue this program in the future. The water savings from implementation of this DMM are not quantified.

6.1.7 DMM 7 - Public Information

Tracy distributes information about water conservation to the public through bill inserts, brochures, community speakers, paid advertising, school education programs, and community

[34] High-efficiency clothes washing machine use one-third less water and one-fourth less energy to clean clothes compared with conventional machines. Instead of agitating clothes back and forth, high-efficiency washers gently lift, toss, and tumble clothing during the spin and rinse cycles and extract more water during the spin cycle.
[35] Qualifying high-efficiency clothes washing machines are listed at www.cee1.org.

events. Tracy also maintains a website providing water conservation tips, rebate applications for high-efficiency clothes washers, and information regarding the residential water survey program.[36]

This public information program is managed by the City's WCC and includes the following activities.

- Distributing bill inserts that promote conservation.
- Promoting water conservation through television and radio advertisements.
- Coordinating with homeowner associations and local non-profit organizations to provide additional water conservation material and speakers.
- Maintaining a booth at Tracy's annual Bean Festival where information is distributed regarding the City's water conservation programs
- Using cinema advertisements by running one promotional slide before every movie at the Tracy Cinemark.

Tracy is actively implementing a public information program to educate its customers about water conservation. However, the water savings from implementation of this DMM are not quantified.

6.1.8 DMM 8 - School Education

Tracy continues to promote water and other resource conservation at City schools. Approximately 5 classroom visits are made each fiscal year at fourth, fifth and sixth grade classes. Tracy also distributes packages of water conservation flyers to the schools for distribution. Approximately $500 of water conservation materials were distributed during each of the last two fiscal years.

Tracy plans to continue working with the school districts and private schools in its service area to provide instructional assistance, educational materials, and classroom presentations that emphasize local urban, agricultural, and environmental issues related to water use. The water savings from implementation of this DMM are not quantified.

6.1.9 DMM 9 - Commercial, Industrial, and Institutional (CII) Accounts

Tracy has implemented the following programs to encourage conservation for commercial, industrial, and institutional accounts.

- Tracy offers a $125 ULFT rebate for its CII customers that are located in pre-1992 buildings. This program was reinstated in August 2007. The rebates are advertised on the City's website[37].
- Tracy is in the process of identifying all CII accounts with dedicated irrigation meters and assigning ETo-based water use budgets to those accounts that exceed 100% of the reference evapotranspiration per square foot of landscape area on a bimonthly basis. Tracy will provide notices in each billing cycle to accounts with water use budgets identifying the relationship between the total water use budget and the actual water consumption at that account.
- Tracy developed a program to target landscaped CII accounts to offer them one or more of the following conservation measures:

[36] http://www.ci.tracy.ca.us/departments/public_works/water_resources/
[37] http://www.ci.tracy.ca.us/departments/public_works/water_resources/

- Landscape water use analysis/surveys;
- Voluntary water use budgets;
- Installation of dedicated landscape meters;
- Training (multi-lingual where appropriate) in landscape maintenance, irrigation system maintenance, and irrigation system design;
- Financial incentives to improve irrigation system efficiency such as loans, rebates, and grants for the purchase and/or installation of water efficient irrigation systems; and/or
- Follow-up water use analyses/surveys consisting of a letter, phone call, or site visit where appropriate.

Water savings from implementation of this DMM are not quantified.

6.1.10 DMM 10 - Wholesaler Incentives

This DMM does not apply to Tracy because Tracy is not a wholesale water agency.

6.1.11 DMM 11 - Water Pricing to Encourage Conservation

In addition to the water meter monthly service charge described in DMM 4 (Section 6.1.4), the City also employs a tiered rate structure based on the quantity of water consumed by each customer. Four tiers are defined by the number of units of water use, with one unit equal to 100 cubic feet (748 gallons). Table 26 shows the unit rates for the City's four pricing blocks, and the cost per unit for the Winter and Summer rating structure.

To compensate for revenue losses and the resultant fiscal impacts during the low-flow winter months and during periods of water conservation, the City varies its water rates seasonally (see Table 26). Additionally, the City Council maintains the authority to adopt conservation pricing and water use surcharges in times of need (TMC 11.28.220 and 11.28.230).

Tracy's current sewer rate structure is included in Appendix P. Water savings from implementation of this DMM are not quantified.

6.1.12 DMM 12 – Water Conservation Coordinator

The duties of the WCC are fulfilled by Stephanie Reyna-Hiestand. As Tracy's Water Conservation Coordinator, Mrs. Reyna-Hiestand's responsibilities are divided as 45% to water conservation efforts, 35% to storm water management, and 20% to groundwater management. The duties of the WCC include coordination and oversight of conservation programs and DMM implementation, preparation and submittal of the USBR Annual Update, communication and promotion of water conservation issues to senior City management, coordination of agency conservation programs with operations and planning staff, and preparation of the annual water conservation budget.

6.1.13 DMM 13 - Waste Prohibitions

Tracy established a water waste prohibition as part of its Water Conservation and Rationing Plan (TMC Chapter 11.28) (Appendix L). The water waste prohibition includes restrictions on landscape irrigation at certain times (see Section 6.1.5), prohibition of "flagrant water waste or

excessive runoff", proper maintenance of plumbing and irrigation systems, prudent conservation measures, and swimming pool and hot tub covers to limit evaporation. Flagrant water waste or excessive water runoff is defined as any water that flows directly from a tap connected to the City water system that leaves the property of origin in a continuous flow of any dimension for 150 feet from the property, or for more than five minutes in duration. Prudent water conservation measures include actions such as hand-held "trigger" nozzle handle sprayers, the use of drought-tolerant landscaping, and watering during non-windy times to prevent excess water loss.

Tracy's Water Conservation and Rationing Plan also dictates measures that the City can implement to reduce or eliminate water waste during periods of extreme dryness. These measures, described in more detail in Section 5 of this UWMP, include restrictions on landscape irrigation, sidewalk and car washing, and other residential, recreational, and commercial uses of water.

Enforcement of the water waste prohibition is done by the Water Conservation Coordinator. The WCC issues Courtesy Notices informing customers regarding violations of the Water Management Ordinance. Usually the first Courtesy Notice induces compliance. If the first notice does not work, Tracy issues two more. If those do not result in compliance, the WCC writes a letter, delivered by certified mail, warning that if the customer does not comply, a citation will be issued by the City.

Tracy enforces its water waste ordinance on a year-round basis. However, the water savings from implementation of this DMM are not quantified. Approximately 200 actions have been taken by the City since 2005 to enforce the water waste ordinance. No citations have had to be issued.

6.1.14 DMM 14 - Ultra Low Flow Toilets

This DMM was implemented by the City in 2001 and the program was reinstated in August 2007. The City budgets $10,000 per year towards ultra-low-flush toilets ("ULFTs") rebates. The City offers rebates of $125 per ULFT to residential and commercial, institutional, and industrial ("CII") customers that are in homes or buildings that were built prior to 1992. The rebates are advertised on the City's website[38]. The number of rebates issued since the program was reinstated in 2007 are listed in Table 25. Water savings from implementation of this DMM are not quantified.

6.2 SCHEDULE OF IMPLEMENTATION

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (f)(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

As described above, all of the aforementioned DMMs are being implemented by the City. In the future, the City is planning to meet the coverage levels required by the CUWCC Memorandum of Understanding. The implementation schedule for complying with the coverage levels is listed in Table 27.

6.3 EFFECTIVENESS OF IMPLEMENTATION

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

[38] http://www.ci.tracy.ca.us/departments/public_works/water_resources/

10631 (f)(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

Tracy meters customer water use and has software that enables the City to track each customer's water consumption. By comparing specific customer accounts before and after the implementation of a particular DMM, such as residential surveys, retrofits, clothes washer replacements, CII audits, and ULFTs, the City endeavors to evaluate the effectiveness of that particular DMM. Compensating for climatic, land use, or other changes at an individual account may make such determination of DMM-specific water savings imperfect.

6.4 CONSERVATION SAVINGS

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (f)(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

A possible method for quantifying the water saved by DMMs includes development of a database that would allow the City to track those accounts that have retrofitted their plumbing fixtures as part of a DMM, such as water-efficient clothes washers and other low-flow equipment, and comparing water use at those accounts pre- and post-retrofit.

Currently, there is no estimate of conservation savings.

6.5 EVALUATION OF DEMAND MANAGEMENT MEASURES NOT IMPLEMENTED

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
10631 (g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:
(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.
(2) Include a cost-benefit analysis, identifying total benefits and total costs.
(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.
(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

Tracy has implemented 13 of the 14 DMMs described by the CUWCC and the UWMP Act. The remaining DMM, the Wholesaler Incentives (DMM 11), does not apply to Tracy because Tracy is not a water wholesaler.

7. CLIMATE CHANGE

Tracy is addressing the potential for climate change to affect the water supply and water use. Climate change may cause the following effects.

- Water supply - A reduced snowpack may shift spring runoff to earlier in the year.
- Water Demand - Hotter temperatures may prolong the irrigation season and increase the need for cooling water at power plants.
- Disaster - Droughts and floods may become more extreme.

Tracy is addressing these effects as described below.

- Water supply - As discussed in Section 5, Tracy has reduced the predicted available water supply due to potential climate change.
- Water Demand - Tracy is implementing the demand management measures as discussed in Section 6 to encourage conservation and reduce water demand.
- Disaster -Tracy has diversified the City's water sources.

8. COMPLETED UWMP CHECKLIST

Provided below is the DWR checklist that details where each UWMP requirement is located in this document.

No.	UWMP requirement	Calif. Water Code reference	Additional clarification	UWMP location
PLAN PREPARATION				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		Section 1.1, Table 1
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		Section 1.2.1, Appendix B
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		Section 1.4, Appendix C
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		Section 1.4
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		Section 1.2.2, Appendix B
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642		Section 1.2, Appendix B
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642		Section 1.4, Appendix C
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643		Section 1.4
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes.	10644(a)		Section 1.4

No.	UWMP requirement	Calif. Water Code reference	Additional clarification	UWMP location
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645		Section 1.4
SYSTEM DESCRIPTION				
8	Describe the water supplier service area.	10631(a)		Section 2.7, Figures 2 and 4
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		Sections 2.4, 2.5, and 2.6
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	Section 2.3, Table 2
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 2.3, Table 2
12	Describe other demographic factors affecting the supplier's water management planning.	10631(a)		Sections 2.1 and 2.2, Figure 2
SYSTEM DEMANDS				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)		Sections 3.5 and 3 .6, Tables 8 and 9
2	*Wholesalers:* Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. *Retailers:* Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	Retailers and wholesalers have slightly different requirements	Appendix C
3	Report progress in meeting urban water use targets using the standardized form.	10608.40		Section 3.6

No.	UWMP requirement	Calif. Water Code reference	Additional clarification	UWMP location
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	Sections 3.1, 3.2, and 3.3 Tables 5, 6, 7, and 8
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	Section 3.4
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		Section 3.2.1, Table 8
SYSTEM SUPPLIES				
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided.	Sections 4.1 through 4.5, Table 12
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	Yes, Section 4.2

No.	UWMP requirement	Calif. Water Code reference	Additional clarification	UWMP location
15	Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		Section 4.2.2 and 4.2.3
16	Describe the groundwater basin.	10631(b)(2)		Section 4.2.1
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)		No
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)		Not Applicable
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)		Section 4.2.3
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		Section 4.2.4, Table 11
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	Section 4.2.5, Table 12
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)		Section 4.7
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)		Section 4.5
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)		Section 4.6
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633		Section 4.9, Tables 13 through 17
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)		Section 4.9.2, Table 15

No.	UWMP requirement	Calif. Water Code reference	Additional clarification	UWMP location
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)		Section 4.9.3
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)		Section 4.9.3
48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)		Section 4.9 4.1
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)		Section 4.9.4.3
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)		Section 4.9.4.4
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)		Section 4.9.4.5
WATER SHORTAGE RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING [b]				
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)		Section 1.3
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)		Sections 5.1, 5.2, and 5.3, Tables 18, 19, and 20
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)		Beginning of Section 5
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)		Section 5.5, Table 21
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)		Section 5.5.2

No.	UWMP requirement	Calif. Water Code reference	Additional clarification	UWMP location
37	Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)		Section 5.5.3.1
38	Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)		Section 5.5.4.1
39	Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)		Section 5.5.4.1, Table 21
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		Section 5.5.4.2
41	Provide an analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)		Section 5.5.5
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)		Section 5.5, Appendix L
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)		Section 5.5.6
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	For years 2010, 2015, 2020, 2025, and 2030	Section 5.4
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		Section 5.6, Tables 22, 23, and 24
DEMAND MANAGEMENT MEASURES				

No.	UWMP requirement	Calif. Water Code reference	Additional clarification	UWMP location
26	Describe how each water demand management measures is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Section 6.1, Tables 25 and 27
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		Section 6.3
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)		Section 6.4, estimate not available
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	Not Applicable
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	Not Applicable

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Table 1
Coordination with Appropriate Agencies and the Public (a)
City of Tracy, California

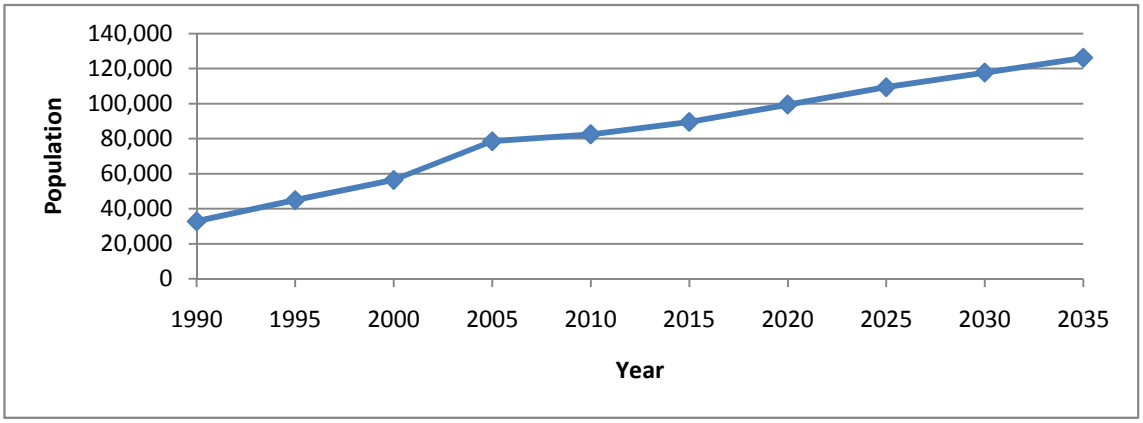
Action	DMC/CVP Agencies	SCWSP Agencies	GW Basin Management Agencies	General Public
Sent notice of intention to prepare UWMP (b)	1/6/2011	1/6/2011	1/6/2011	1/25/2011
Notice of Public Hearing (c)	2/22/2011	2/22/2011	2/22/2011	2/28/11 & 3/7/2011
Received copy of draft UWMP (d)				4/18/2011
Commented on the draft UWMP				5/17/2011 (e)
Attended public meetings				5/17/2011

Abbreviations:
CVP = Central Valley Project
DMC = Delta Mendota Canal
GW = Groundwater
UWMP = Urban Water Management Plan
SCWSP = South County Water Supply Project

Notes:
(a) The agencies referred to as the DMC/CVP Agencies, the SCWSP Agencies, and the GW Basin Management Agencies are listed in the text and in Appendix B.
(b) Notice of intent to prepare the 2011 UWMP was sent to agencies on 6 January 2011. Public notice was published in the Tri Valley Herald on 25 January 2011. No comments were received from the notified agencies.
(c) Notice of public review was sent to agencies on 22 February 2011. Public notice was published in the Tri Valley Herald on 28 February 2011 and on 7 March 2011.
(d) Public review draft of UWMP was posted on the City's website on 18 April 2011.
(e) Public hearing was held on 17 May 2011. No comments were received from the public.

Table 2
Historical and Projected Service Area Population
City of Tracy, California

	Historic (a)					Projected (b)				
Year	**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Population	32,827	44,923	56,447	78,546	82,484	89,503	99,440	109,377	117,744	126,110



Notes:

(a) Historic population is from References 1 and 2 for the City of Tracy with the addition of 377 residents served in the Larch Clover County Services District. The Larch Clover County Services District population was calculated by multiplying 3.279 people per household for Tracy from Reference 3 by 115 residences from Reference 4.

(b) Population for 2025 is from Reference 5 with the addition of the people from the Larch Clover area as described in Note (a). Population from the existing 2010 population to the General Plan projected 2025 population is assumed to grow linearly. The 2040 population is assumed from Reference 6. A linear population growth rate from 2025 General Plan projected population to the 2040 Master Plan projected population is assumed.

References:

(1) State of California, Department of Finance, E-4 Historical Population Estimates for City, County and the State, 1991-2000, with 1990 and 2000 Census Counts. Sacramento, California, August 2007.

(2) State of California, Department of Finance, E-4 Population Estimates for Cities, Counties and the State, 2001-2010, with 2000 Benchmark. Sacramento, California, May 2010.

(3) State of California, Department of Finance, E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2008, with 2000 Benchmark. Sacramento, California, May 2008.

(4) Personal communication with the Tracy Finance Department on 2011-02-14.

(5) City of Tracy General Plan, 22 April 2009 page 2-9 footnote.

(6) Draft Citywide Water System Master Plan, (WYA, 2011).

Table 3
Number of Accounts by Customer Sector in 2010
City of Tracy, California

Customer Sector		Metered Accounts (a)	
		# of Accounts	% of Total
Residential	Residential Single Family	21,752	93%
	Residential Multi Family	522	2%
	Subtotal Residential	*22,274*	95%
CII	Commercial	752	3%
	Industrial	3	0.01%
	Institutional (b)	--	--
	Subtotal CII	*755*	3%
Other	Other	--	--
	Irrigation (c)	420	2%
	Subtotal Other	*420*	2%
Total		**23,449**	**100%**

Abbreviations:
CII = Commercial, Industrial, and Institutional Customers

Notes:
(a) Number of accounts were provided by the City's Finance Department as of 1 December 2010.
(b) Number of institutional accounts are not currently tracked by the City.
(c) Number of irrigation accounts was estimated by the City.

Table 4
Pressure Zone Elevations and Static Pressures (a)
City of Tracy, California

Pressure Zones	Service Elevation Range (ft)	Static Pressure Range (psi)
Zone 1	0-75	40-75
Zone 2	75-150	40-85
Zone 3	Undeveloped (b)	Undeveloped (b)
Zone 4	Future	Future
Zone 5	Future	Future

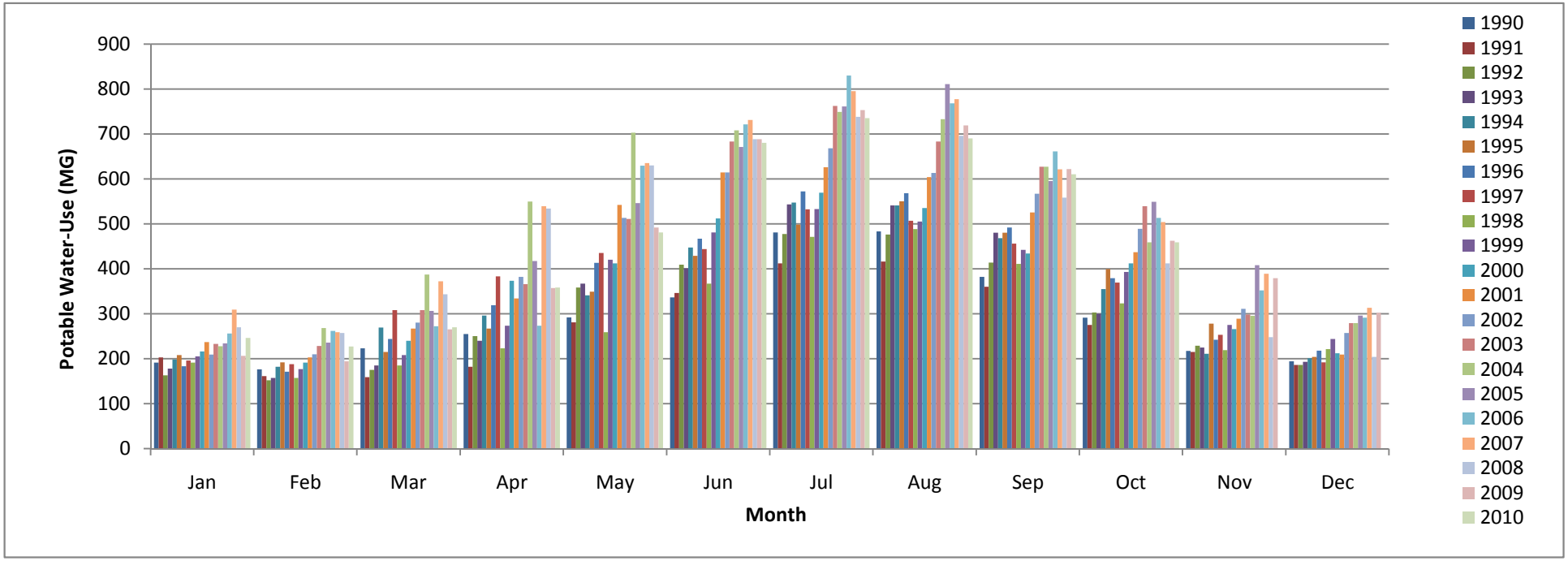
Abbreviations:
ft = Feet
psi = Pounds per square inch

Notes:
(a) Adapted from Draft Citywide Water Master Plan, (WYA, 2011). Zones shown on Figure 4.
(b) Patterson Pass Business Park (i.e., Safeway and Costco) is located in Zone 3, but is currently served through the Patterson Pass booster pump station supplied by Zone 2.

Table 5
Current and Historical Monthly Potable Water Demand
City of Tracy, California

Month	Potable Water Demand (MG) (a)																				
	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
January	191	203	163	178	198	208	183	196	191	205	216	237	209	233	228	234	256	309	270	206	246
February	176	161	152	157	182	192	171	188	157	177	191	203	210	228	268	236	262	259	257	194	227
March	223	159	175	185	269	215	244	308	185	208	240	267	280	308	387	306	272	372	343	265	270
April	255	182	250	240	296	267	319	383	223	273	373	334	382	366	549	417	273	539	534	357	358
May	292	281	358	367	341	349	413	435	259	420	412	542	513	511	703	546	629	635	630	492	481
June	336	346	409	401	447	429	467	444	367	481	512	614	614	683	708	671	721	731	688	688	680
July	481	412	477	543	547	498	572	532	471	533	569	626	668	762	749	761	830	795	738	753	735
August	483	416	476	541	541	550	568	507	488	505	535	604	613	683	733	811	768	777	696	719	690
September	382	360	414	480	468	480	492	456	411	442	434	525	567	627	627	595	661	621	558	622	610
October	291	275	303	300	355	399	379	369	323	393	412	437	489	539	459	549	513	504	412	462	459
November	217	215	229	225	211	278	242	253	219	275	266	289	311	298	295	408	352	389	248	379	320
December	194	186	186	193	201	204	218	192	221	244	212	209	257	279	279	296	291	313	204	302	266
Total (MG)	3,521	3,196	3,592	3,810	4,056	4,069	4,268	4,263	3,515	4,156	4,372	4,887	5,113	5,517	5,985	5,830	5,828	6,244	5,578	5,439	5,342
Total (ac-ft)	10,806	9,808	11,023	11,692	12,447	12,487	13,098	13,083	10,787	12,754	13,417	14,998	15,691	16,931	18,369	17,892	17,885	19,162	17,118	16,692	16,394

Table 5
Current and Historical Monthly Potable Water Demand
City of Tracy, California

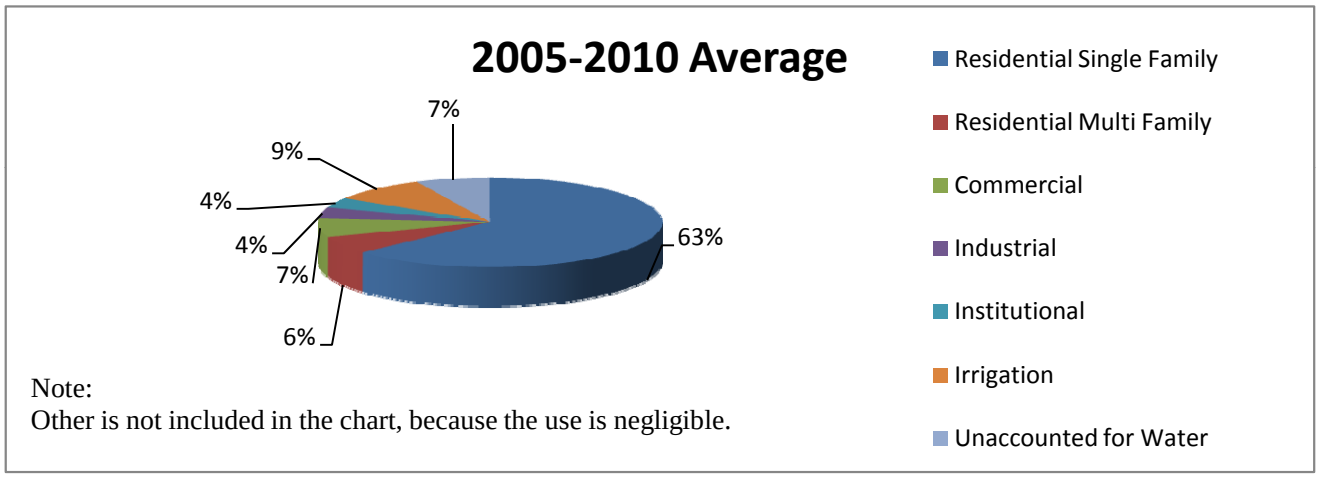


Abbreviations:
ac-ft = acre-feet
MG = Millions of gallons

Notes:
(a) Water demand data were provided by Tracy's Finance Department on 18 January 2011 and do not include unaccounted for water. A discussion of unaccounted for water is included in Section 3.1.3.

Table 6
Current and Historical Potable Water Demand by Water Demand Sector
City of Tracy, California

Water Demand Sector	Potable Water Demand (ac-ft/yr) (a) (b)						
	2005	2006	2007	2008	2009	2010 (c)	Average
Residential Single Family	13,525	12,475	12,581	12,765	10,359	9,468	11,862
Residential Multi Family	1,338	1,234	1,244	1,262	1,025	936	1,173
Subtotal Residential	*14,863*	*13,709*	*13,825*	*14,027*	*11,384*	*10,404*	*13,040*
Commercial	1,181	1,247	1,102	1,339	1,291	1,346	1,251
Industrial	737	826	775	770	772	625	751
Institutional	558	594	587	662	633	1,143	696
Subtotal CII	*2,476*	*2,667*	*2,464*	*2,771*	*2,696*	*3,114*	*2,698*
Other (d)	24	27	25	28	14	3	20
Irrigation	1,258	1,540	1,321	1,805	2,130	2,117	1,695
Subtotal Other	*1,282*	*1,567*	*1,346*	*1,833*	*2,144*	*2,120*	*1,715*
Total Water Consumption	**18,620**	**17,940**	**17,640**	**18,630**	**16,220**	**15,640**	**17,450**
Unaccounted for Water (e)	-4.1%	0.3%	8.0%	-8.8%	2.8%	5.8%	--
Total Water Demand (f)	**17,892**	**18,000**	**19,176**	**17,118**	**16,693**	**16,603**	**18,759**



Note:
Other is not included in the chart, because the use is negligible.

Abbreviations:
ac-ft/yr = Acre-feet per year
CII = Commercial, Industrial, and Institutional

Table 6
Current and Historical Potable Water Demand by Water Demand Sector
City of Tracy, California

Notes:

(a) Estimates of water demand by customer sector for 2005-2009 are from Table 4-4 in Reference 1 and for 2010 are from Reference 2. Estimates of multi family water demand are based on 9 % of residential demand. No water is used for agriculture, saline water intrusion barriers, groundwater recharge, conjunctive use, or sold to other agencies.

(b) Subtotals may not add exactly due to rounding.

(c) Water demand estimates for November through December 2010 are projected using historic water demand patterns.

(d) Other includes unclassified water demand.

(e) Unaccounted for water is the quantity of water purchased and produced by the City, less the known quantity of water used by metered accounts. Reported as a percent of the total water demand. Assumed unaccounted for water is 7% in future as discussed in the text.

(f) Total water demand is the quantity of purchased surface water supplies plus the quantity of water produced by the City's groundwater wells. Total water demand is from Table 4-2 in Reference 1 for 2006-2009. Data from 2010 were provided by City on 18 January 2011.

References:

(1) Draft Citywide Water System Master Plan, (WYA, 2011).

(2) 05-10 User Class Monthly (v. 3.50) and 05-10 Residential Monthly (v. 3.50) provided by the City 9 December 2010.

Table 7
Projected Potable Water Demand Itemized by Future Development
City of Tracy, California

Future Development Projects	Projected Potable Water Demand at Buildout (ac-ft/yr) (a)
Development Projects with Approved Water Supply	
Residential Areas Specific Plan	45
Industrial Areas Specific Plan	574
I-205 Corridor Specific Plan	271
Plan "C"	74
Northeast Industrial	702
South MacArthur	59
Downtown Specific Plan	185
Infill	806
Ellis Specific Plan	1,076
Gateway - Phase 1	--
Holly Sugar Sports Park	47
Subtotal	3,839
Future Planning Areas	
Westside Residential (URs 5, 7, 8, 9)	1,169
UR 1	1,237
South Linne (UR 11)	153
Tracy Hills	2,985
Gateway PUD (excluding Phase 1)	--
Cordes Ranch (UR 6)	2,233
Bright (UR 4)	411
Catellus (UR 3)	839
Filios (UR 2)	70
I-205 Expansion	292
Westside Industrial	618
Eastside Industrial	469
Larch Clover County Services District	847
Chrisman Road	150
Rocha	248
Berg/Byron	164
Kagehiro	120
Subtotal	12,005
Total	**15,844**

Abbreviations:
ac-ft/yr = Acre feet per year
UR = Urban Reserve

Notes:
(a) Projected potable water demand from Table D-2 in Draft Citywide Water System Master Plan, (WYA, 2011).
(b) Projected potable water demand does include unaccounted for water per the Master Plan.

Table 8
Projected Potable Water Demand by Water Demand Sector
City of Tracy, California

Water Demand Sector	Potable Water Demand (ac-ft/yr)					
	2010 (a)	2015 (b)	2020 (b)	2025 (b)	2030 (b)	2035 (b)
Residential Single Family	9,468	13,600	13,500	14,800	15,400	16,000
Residential Multi Family	936	1,450	1,580	1,710	1,840	1,970
Future Low Income - Single Family (c)	--	347	693	1,040	1,390	1,730
Future Low Income - Multi Family (c)	--	34	69	103	137	170
Subtotal Residential	10,404	15,400	15,900	17,600	18,700	19,870
Commercial	1,346	1,790	2,220	2,650	3,070	3,500
Industrial	625	2,120	2,960	3,800	4,640	5,470
Institutional	1,143	696	756	816	876	936
Subtotal CII	3,114	4,610	5,930	7,260	8,590	9,900
Other (d)	24	0	0	0	0	0
Irrigation	1,258	1,320	1,320	1,320	1,320	1,320
Subtotal Other	1,282	1,320	1,320	1,320	1,320	1,320
Total Water Consumption	18,620	21,300	23,100	26,200	28,600	31,090
Unaccounted for Water (e)	--	7.5%	7.5%	7.5%	7.5%	7.5%
Total Water Demand (f)	**17,900**	**23,000**	**25,000**	**28,300**	**31,000**	**33,600**

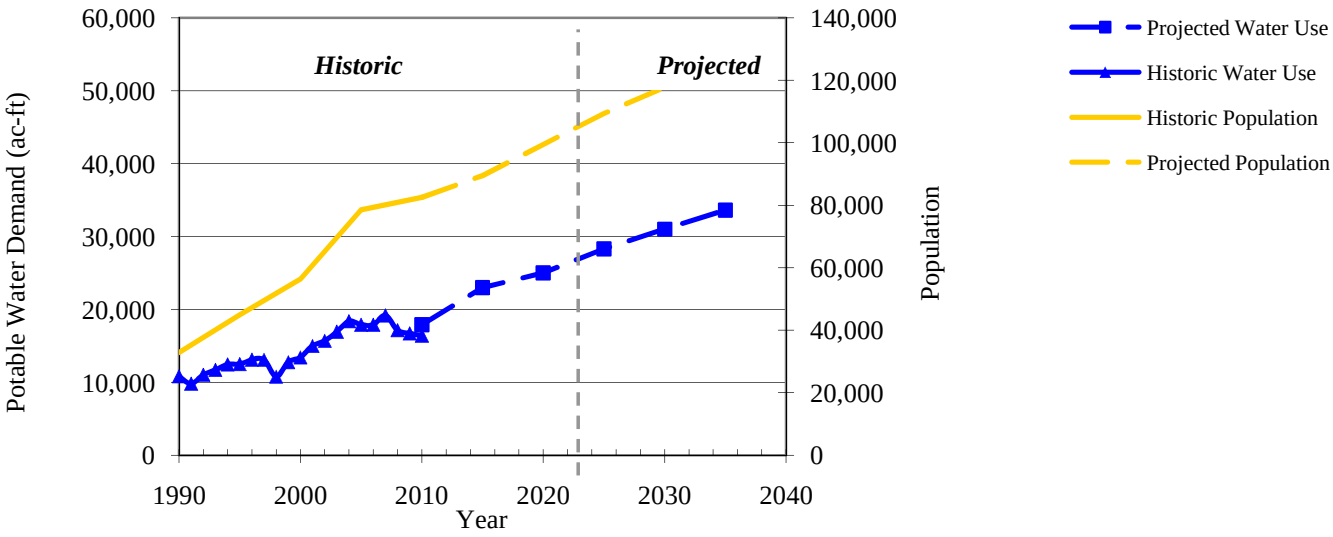


Table 8
Projected Potable Water Demand by Water Demand Sector
City of Tracy, California

Abbreviations:

ac-ft/yr = Acre-feet per year
CII = Commercial, Industrial, and Institutional
gpd = gallons per day

Notes:

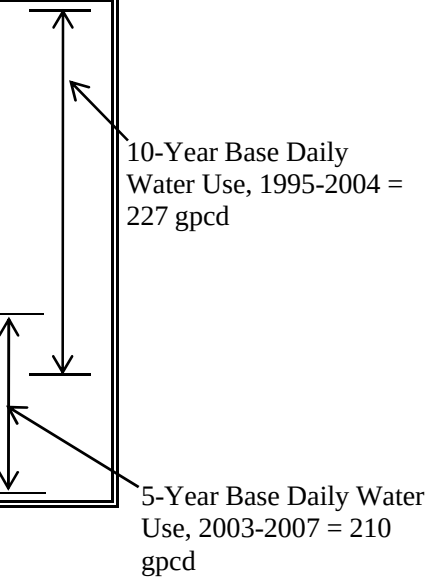
(a) 2010 water demand is observed data from Table 6.
(b) Projected potable water demand calculated by assuming a linear increase in water demand from 2007 through 2040. Water demand for 2007 and 2040 are from Reference 1 Appendix D2.
(c) Future low income water demand was calculated based on the number of units for extremely low and very low income categories from Reference 2, Table 33, multiplied by an assumed 310 gpd per dwelling unit (assumed medium density from Reference 1). Water demand was split between single and multifamily categories based on historic City water usage data for these two categories. The same amount of low income water demand was assumed to be added each additional five year period.
(d) Water historically accounted for in the "Other" category will be accounted for by the City in the other sector categories in the future.
(e) The percentage of unaccounted for water is based on Reference 1.
(f) Total water demand is the projected quantity of purchased surface water supplies plus the quantity of water produced by the City's groundwater wells.

Reference:

(1) Draft Citywide Water System Master Plan, (WYA, 2011).
(2) Draft City of Tracy 2009-2014 Housing Element, June 2010.

Table 9
Daily Per Capita Water Use
City of Tracy, California

Year	Service Area Gross Water Use, MGD (a)	Service Area Population, people (b)	Gallons Per Capita Day, gpcd (c)
1995	11.34	44,923	252
1996	11.95	46,326	258
1997	11.90	47,805	249
1998	9.89	49,339	200
1999	11.71	52,336	224
2000	12.80	56,447	227
2001	13.06	61,492	212
2002	14.00	66,407	211
2003	15.15	70,424	215
2004	16.40	75,044	218
2005	15.98	78,546	203
2006	16.07	80,452	200
2007	17.12	80,824	212



Abbreviations:
MGD = Millions of gallons per day
gpcd = gallons per capita per day

Notes:
(a) From Table 4-2 in Draft Citywide Water System Master Plan, (WYA, 2011).
(b) Population is from References 1 and 2 for the City of Tracy with the addition of 377 residents served in the Larch Clover County Services District. The Larch Clover County Services District population is calculated by multiplying 3.279 people per household for Tracy from Reference 3 by 115 residences from Reference 4.
(c) Gallons Per Capita Day equals gross water use divided by service area population.

References:
(1) State of California, Department of Finance, E-4 Historical Population Estimates for City, County and the State, 1991-2000, with 1990 and 2000 Census Counts. Sacramento, California, August 2007.
(2) State of California, Department of Finance, E-4 Population Estimates for Cities, Counties and the State, 2001-2010, with 2000 Benchmark. Sacramento, California, May 2010.
(3) State of California, Department of Finance, E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2008, with 2000 Benchmark. Sacramento, California, May 2008.
(4) Personal communication with the Tracy Finance Department on 14 February 2011.

Table 10
Daily Per Capita Water Use Target Calculated by Method 1

City of Tracy, California

Water Use Baseline and Targets	Water Use gpcd
10-Year Base Daily Water Use, 1995-2004 (a)	227
2020 Target (20% less than 10-Year average) (b)	182
2015 Target (c)	204

Abbreviations:

gpcd = Gallons per capita per day

Notes:

(a) Refer to Table 9 for historical water use. Tracy has not historically used recycled water, therefore, per SB 7, a ten year baseline should be used.

(b) Using Method 1, 2020 Target is calculated as 20 percent less than the 10 year average base daily water use.

(c) 2015 Target is calculated as the midpoint between the 10 year average and the 2020 Target.

Table 11
Current and Historical Potable Water Supply
City of Tracy, California

Year	Surface Water				Groundwater		Total Production ac-ft/yr
	USBR ac-ft/yr	SCWSP ac-ft/yr	Total Surface Water ac-ft/yr	Percentage of Supply	Groundwater ac-ft/yr	Percentage of Supply	
2005 (a,b)	8,920	3,146	12,066	67%	5,826	33%	17,892
2006 (a)	6,048	8,918	14,966	83%	3,034	17%	18,000
2007 (a)	6,374	9,130	15,504	81%	3,672	19%	19,176
2008 (a)	6,503	8,017	14,520	85%	2,598	15%	17,118
2009 (a)	4,965	10,401	15,366	92%	1,327	8%	16,693
2010 (c)	5,303	10,850	16,153	97%	498	3%	16,651

Abbreviations:
ac-ft/yr = Acre-feet per year
SCWSP = South County Water Supply Project
USBR = United States Bureau of Reclamation

Notes:
(a) From Table 4-2 of Draft Citywide Water System Master Plan, (WYA, 2011).
(b) Surface water deliveries from SCWSP started in 2005.
(c) Current and historical water supply from 2010 PRODUCTION TOTALS.xls received from the City on 18 January 2011. The provided file was modified by removing the 420 ac-ft/yr that is transferred to another agency (to serve the Patterson Business Park) from the USBR supply.

Table 12
Current and Projected Contractual Potable Water Supply Entitlements
City of Tracy, California

	Potable Water Source (a)	Water Right/Contract	Quantity of Water Right/Contractual Entitlement (ac-ft/yr) (b)					
			2010	2015	2020	2025	2030	2035
Current	DMC/CVP	USBR Tracy Contract-M&I Reliability	10,000	10,000	10,000	10,000	10,000	10,000
	DMC/CVP	USBR BCID Contract-Ag Reliability	5,000	5,000	5,000	5,000	5,000	5,000
	DMC/CVP	USBR WSID Contract-Ag Reliability	2,500	2,500	2,500	2,500	2,500	2,500
	SCWSP	Pre-1914 Rights	10,000	10,000	10,000	10,000	10,000	10,000
	Groundwater (c)	Over/Approp. Rights	4,000	2,500	2,500	2,500	2,500	2,500
Expected	DMC/CVP	USBR BBID Contract-Ag Reliability	0	3,000	6,000	9,000	11,000	11,000
	DMC/CVP	USBR WSID Contract-Ag Reliability	0	2,500	2,500	2,500	2,500	2,500
	Clifton Court Forebay	BBID Pre-1914 Rights	0	1,000	2,000	3,000	3,000	3,000
	SCWSP	Pre-1914 Rights	0	3,000	3,000	3,000	3,000	3,000
Total Projected Available Potable Water Supply			**31,500**	**39,500**	**43,500**	**47,500**	**49,500**	**49,500**
	Semitropic (d)	Water Banking	333	3,500	3,500	3,500	3,500	3,500
	ASR	Water Banking	0	3,000	3,000	3,000	3,000	3,000
Total Projected Drought Supply (e)			**333**	**6,500**	**6,500**	**6,500**	**6,500**	**6,500**
Total Projected Potable Water Supply			**31,833**	**46,000**	**50,000**	**54,000**	**56,000**	**56,000**

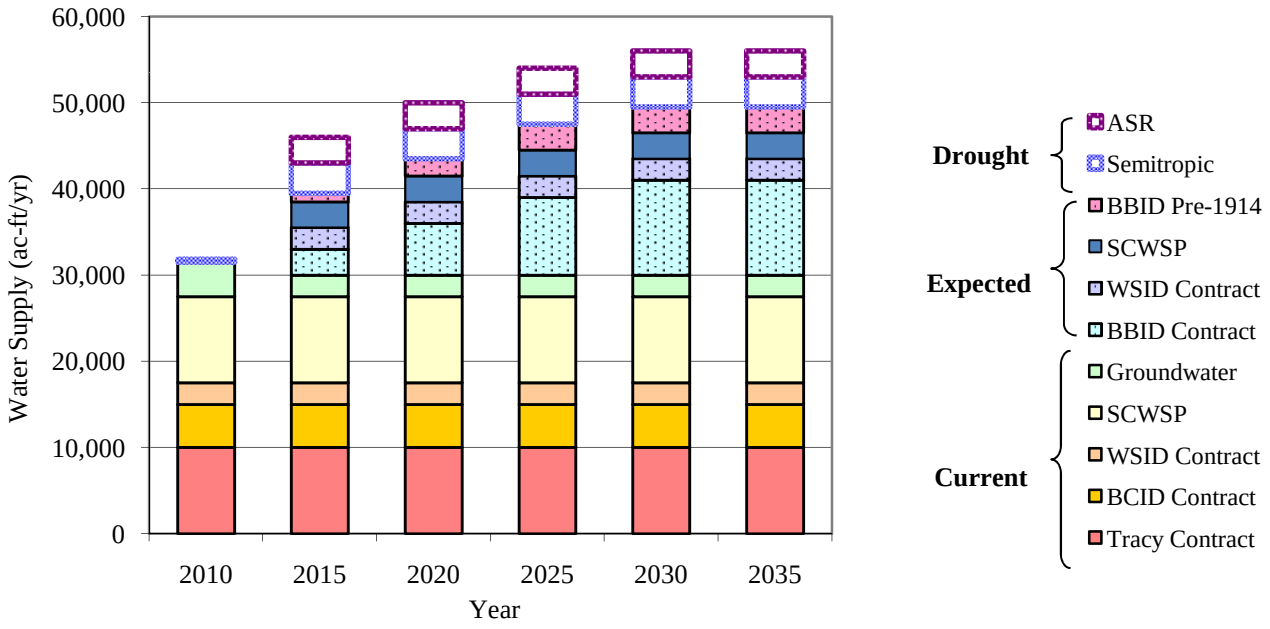


Table 12
Current and Projected Contractual Potable Water Supply Entitlements
City of Tracy, California

Abbreviations:
ac-ft/yr = Acre-feet per year
ASR = Aquifer storage and recovery
BCID = Banta-Carbona Irrigation District
BBID = Byron-Bethany Irrigation District
DMC/CVP = Central Valley Project water transported via the Delta Mendota Canal
Over/Approp. = Overlying and appropriative water rights
Pre-1914 = Water rights established prior to 1914 (the most senior water rights)
SCWSP = South County Water Supply Project
USBR = United States Bureau of Reclamation
WSID = West Side Irrigation District

Notes:
(a) Current water supply sources are contracts or water rights currently held by the City. Expected water supply sources are contracts that the City anticipates will be in place by the indicated year. For a complete description of each water source and contract, see Section 4 of text.
(b) Information regarding the expected quantity of water received in future years was provided by the Deputy Director of Public Works, Steve Bayley, and current USBR and SCWSP contracts.
(c) Though the City can sustainably extract up to 9,000 ac-ft/yr of groundwater, Tracy is planning to scale back its groundwater extraction in future years to increase the overall quality of its water supply. Tracy will continue to rely on groundwater for peaking and drought and emergency supplies, among other things, up to 9,000 ac-ft per year, on an as needed basis.
(d) If the City were to secure 10,500 ac-ft of storage in the Semitropic water bank, Tracy would be provided with up to 3,500 ac-ft of water annually. If Tracy were to use water from the Semitropic water bank in any given year, it would work to manage its supplies during subsequent years such that it could "refill" its water bank for future use (see Section 4.4.4 of text).
(e) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought.

Table 13
Non-Potable Water Supply
City of Tracy, California

Non-Potable Water Source (a)	Supply ac-ft/yr
Existing	
Diversions of Non-Potable Water from Sugar Cut (b)	Up to 1,800
Future	
Recycled Water (c)	TBD
Interim raw water supply from West Side Irrigation District (d)	TBD
Shallow Non-Potable Groundwater (e)	Not recommended

Abbreviations:
ac-ft/yr = Acre feet per year
TBD = To Be Determined

Notes:
(a) From Table 5-1 of Draft Citywide Water System Master Plan, (WYA, 2011), except as noted.
(b) This existing water supply will be used to irrigate the proposed Holly Sugar Sports Park in the interim period until recycled water is available. This water does not enter the City's distribution system and therefore is not counted as part of the gross water use.
(c) The available quantity of recycled water will be determined in the Citywide Wastewater Master Plan.
(d) From Draft Citywide Water System Master Plan Table 9-2, (WYA, 2011). Demands for the Gateway ponds and roadways may be met with non-potable raw water.
(e) Shallow non-potable groundwater is not recommended for use due to poor water quality. See Section 4.6 for further discussion.

Table 14

Recycled Water Uses Allowed In California, California Code Of Regulations, Title 22, Articles 3 and 5.1

City of Tracy, California

	Treatment Level				
	Disinfected Tertiary Recycled Water	Disinfected Secondary-2.2 Recycled Water	Disinfected Secondary-23 Recycled Water	Undisinfected Secondary Recycled Water	Other
IRRIGATION					
• Food crops where recycled water contacts the edible portion of the crop, including all root crops • Parks and playgrounds • School yards • Residential landscaping • Unrestricted access golf courses • Any other irrigation uses not prohibited by other provisions of the California Code of Regulations	Allowed	Not allowed	Not allowed	Not allowed	Coagulation unnecessary provided filter effluent turbidity $\leq$ 2 NTU, turbidity of influent is continuously measured, influent turbidity > 5 NTU for $\leq$ 15 min and never > 10 NTU, and that there is capability to automatically activate chemical addition or divert the wastewater if the filter influent turbidity > 5 NTU for > 15 min.
• Food crops where edible portion is produced above ground and not contacted by recycled water	Allowed	Allowed	Not allowed	Not allowed	
• Cemeteries • Freeway landscaping • Restricted access golf courses • Ornamental nursery stock and sod farms where access by general public is not restricted • Pasture for animals producing milk for human consumption • Nonedible vegetation with access control to prevent use as a park, playground, or school yard	Allowed	Allowed	Allowed	Not allowed	
• Orchards with no contact between edible portion and recycled water • Vineyards with no contact between edible portion and recycled water	Allowed	Allowed	Allowed	Allowed	

Table 14
Recycled Water Uses Allowed In California, California Code Of Regulations, Title 22, Articles 3 and 5.1
City of Tracy, California

	Treatment Level				
	Disinfected Tertiary Recycled Water	Disinfected Secondary-2.2 Recycled Water	Disinfected Secondary-23 Recycled Water	Undisinfected Secondary Recycled Water	Other
IRRIGATION					
• Non food-bearing trees, including Christmas tree farms not irrigated less than 14 days before harvest or allowing access to the public • Fodder and fiber crops and pasture for animals not producing milk for human consumption • Seed crops not eaten by humans • Food crops that undergo commercial pathogen-destroying processing before consumption by humans • Ornamental nursery stock and sod farms not irrigated less than 14 days before harvest, retail sale, or allowing access by the general public	Allowed	Allowed	Allowed	Allowed	
IMPOUNDMENT					
• Non-restricted recreational impoundments	Allowed assuming conventional treatment, or as noted in "Other" column (a) (b)	Not allowed	Not allowed	Not allowed	Disinfected tertiary recycled water without conventional treatment is allowed assuming the following monitoring is performed: Sample and analyze monthly at point following disinfection and prior to entry to use impoundment for Giardia, enteric viruses, and Cryptosporidium during first 12 months of operation and use, then quarterly thereafter, discontinuing after 2 years with department approval.
• Restricted recreational impoundments and publicly accessible fish hatcheries	Allowed	Allowed	Not allowed	Not allowed	
• Landscape impoundments without decorative fountains	Allowed	Allowed	Allowed	Not allowed	

Table 14
Recycled Water Uses Allowed In California, California Code Of Regulations, Title 22, Articles 3 and 5.1
City of Tracy, California

	Treatment Level				
	Disinfected Tertiary Recycled Water	Disinfected Secondary-2.2 Recycled Water	Disinfected Secondary-23 Recycled Water	Undisinfected Secondary Recycled Water	Other
COOLING AND AIR CONDITIONING					
• Industrial or commercial cooling or air conditioning involving cooling tower, evaporative condenser, spraying, or any mechanism that that creates a mist	Allowed (c)	Not allowed	Not allowed	Not allowed	
• Industrial or commercial cooling or air conditioning not involving a cooling tower, evaporative condenser, spraying, or other mechanism that creates a mist	Allowed	Allowed	Allowed	Not allowed	
OTHER USES					
• Groundwater recharge	Allowed under special case-by-case permits by RWQCBs (d)				
• Flushing toilets and urinals (e) • Priming drain traps • Industrial process water that may contact workers • Structural firefighting • Decorative fountains • Commercial laundries • Consolidation of backfill around potable water pipelines • Artificial snow making for commercial outdoor use • Commercial car washes, including hand washes if public is excluded from the washing process.	Allowed	Not allowed	Not allowed	Not allowed	Coagulation unnecessary provided filter effluent turbidity < 2 NTU, turbidity of influent is continuously measured, influent turbidity > 5 NTU for < 15 min and never > 10 NTU, and that there is capability to automatically activate chemical addition or divert the wastewater if the filter influent turbidity > 5 NTU for > 15 min.

Table 14
Recycled Water Uses Allowed In California, California Code Of Regulations, Title 22, Articles 3 and 5.1
City of Tracy, California

	Treatment Level				
	Disinfected Tertiary Recycled Water	Disinfected Secondary-2.2 Recycled Water	Disinfected Secondary-23 Recycled Water	Undisinfected Secondary Recycled Water	Other
OTHER USES (continued)					
• Industrial boiler feed • Nonstructural fire fighting • Backfill consolidation around non-potable piping • Soil compaction • Mixing concrete • Dust control on roads and streets • Cleaning roads, sidewalks and outdoor work areas • Industrial process water that will not come into contact with workers	Allowed	Allowed	Allowed	Not allowed	
• Flushing sanitary sewers	Allowed	Allowed	Allowed	Allowed	

Abbreviations:
NTU = Nephelometric turbidity units
RWQCB = Regional Water Quality Control Board

Notes:
(a) "Conventional treatment" is defined as any treatment that utilizes a sedimentation unit process between the coagulation and filtration processes and produces disinfected tertiary recycled water effluent.
(b) Tertiary standards to be met at the point between the disinfection process and the point of entry to the use impoundment.
(c) Drift eliminators and/or biocides are required if public or employees can be exposed to mist.
(d) Refer to Groundwater Recharge Guidelines, California Department of Health Services.
(e) Title 22, Article 5 currently prohibits recycled water for internal use in free-standing single-family residences or in any facility producing or processing food products or beverages.

Table 15
Historical and Projected Wastewater Flows
City of Tracy, California

	Year	Average Daily Flow MGD
Historic (a)	2005	9.60
	2006	9.72
	2007	8.53
	2008	8.65
	2009	8.26
	2010 (b)	8.80
Projected (c)	2015	11.1
	2020	13.3
	2025	15.6
	2030	17.8
	2035	20.1

Abbreviations:
MGD = Millions of gallons per day

Notes:
(a) Current and historical wastewater flow data were provided by the City Department of Public Works on 1 December 2010.
(b) Data are only available through 29 November 2010, therefore data for 2010 do not represent the entire annual flow.
(c) Wastewater flow projection for 2040 was provided by Steve Decou, CH2M Hill, 2 March 2011. Linear growth was assumed between 2010 and 2040.

Table 16
Projected Build-out Recycled Water Demand
City of Tracy, California

Water Users	Projected Annual Recycled Water Demand (ac-ft/yr)
Gateway Ponds (a)	228
City Parks (a)	722
Gateway Roadways (a)	61
Tracy Gateway Phase 1 (a)	84
Holly Sugar Sports Park (a)	485
Westside Residential (URs 5, 7, 8, 9) (a)	313
UR 1 (a)	396
South Linne (UR 11) (a)	72
Tracy Hills (a)	1,758
Tracy Gateway (excluding Phase 1) (a)	449
Cordes Ranch (UR 6) (a)	1,034
Bright (UR 4) (a)	111
Catellus (UR 3) (a)	388
Filios (UR 2) (a)	26
I-205 Expansion (a)	103
Westside Industrial (a)	291
Eastside Industrial (a)	221
Larch Clover (a)	299
Chrisman Road (a)	68
Rocha (a)	46
Berg/Byron (a)	56
Kagehiro (a)	20
Mulqueeney Ranch Pumped Storage Project (b)	500
Roberts Island Project (b)	500
Tracy Green Energy Project (c)	To be determined
Subtotal	8,231
Unaccounted for Water at 7.5%	617
Projected Total	**8,848**

Abbreviations:
ac-ft/yr = Acre feet per year
UR = Urban Reserve

Notes:
(a) Table adapted from Table 9-2 in Draft Citywide Water System Master Plan (WYA, 2011) except as otherwise noted.
(b) Demand from City of Tracy 17 February 2009 City Council agenda item 1.D
(c) Demand from email from Steve Bayley on 7 March 2011.

Table 17
Projected Timing of Recycled Water Demand (a)
City of Tracy, California

Source of Recycled Water Demand	Projected Recycled Water Demand (ac-ft/yr)				
	2015	2020	2025	2030	2035
Draft Water System Master Plan Projects (a)	1,200	2,410	3,620	4,830	6,040
Mulqueeney Ranch Pumped Storage Project (b)			To be determined		
Roberts Island Project (b)			To be determined		
Tracy Green Energy Project (c)			To be determined		
Total	1,200	2,410	3,620	4,830	6,040

Abbreviations:
ac-ft/yr = Acre feet per year

Notes:
(a) It is assumed that the recycled water system will expand 3.33% per year, based on starting in 2010 with zero water demand and increasing to the 2040 buildout water uses listed in the Draft Water System Master Plan, (WYA, 2011).
(b) Phasing of recycled water project unknown.
(c) Information from email from Steve Bayley on 7 March 2011.

Table 18
Current and Projected Water Supply Allocations - Normal Year
City of Tracy, California

	Water Source (a)	Water Right/Contract	Reliability Factor (b)	Estimated Supply Allocation (ac-ft/yr) (c) (d) 2010	2015	2020	2025	2030	2035
No Water Banking	Current Supplies								
	DMC/CVP	USBR Tracy Contract-M&I Reliability	75%	7,500	7,500	7,500	7,500	7,500	7,500
	DMC/CVP	USBR BCID Contract-Ag Reliability	50%	2,500	2,500	2,500	2,500	2,500	2,500
	DMC/CVP	USBR WSID Contract-Ag Reliability	50%	1,250	1,250	1,250	1,250	1,250	1,250
	SCWSP	Pre-1914 Rights	100%	10,000	10,000	10,000	10,000	10,000	10,000
	Groundwater (e)	Over/Approp. Rights	100%	4,000	2,500	2,500	2,500	2,500	2,500
	Expected Supplies								
	DMC/CVP	USBR BBID Contract-Ag Reliability	50%	0	1,500	3,000	4,500	5,500	5,500
	DMC/CVP	USBR WSID Contract-Ag Reliability	50%	0	1,250	1,250	1,250	1,250	1,250
	Clifton Court Forebay	BBID Pre-1914 Rights	100%	0	1,000	2,000	3,000	3,000	3,000
	SCWSP	Pre-1914 Rights	100%	0	3,000	3,000	3,000	3,000	3,000
	Total Projected Available Supply			**25,250**	**30,500**	**33,000**	**35,500**	**36,500**	**36,500**
	% Cutback from Normal Year			**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
Water Banking	Semitropic (f)	Water Banking	100%	333	3,500	3,500	3,500	3,500	3,500
	ASR	Water Banking	100%	0	3,000	3,000	3,000	3,000	3,000
	Total Projected Drought Supply (g)			**333**	**6,500**	**6,500**	**6,500**	**6,500**	**6,500**
	Total Projected Supply			**25,583**	**37,000**	**39,500**	**42,000**	**43,000**	**43,000**
	% Cutback from Normal Year			**0%**	**0%**	**0%**	**0%**	**0%**	**0%**

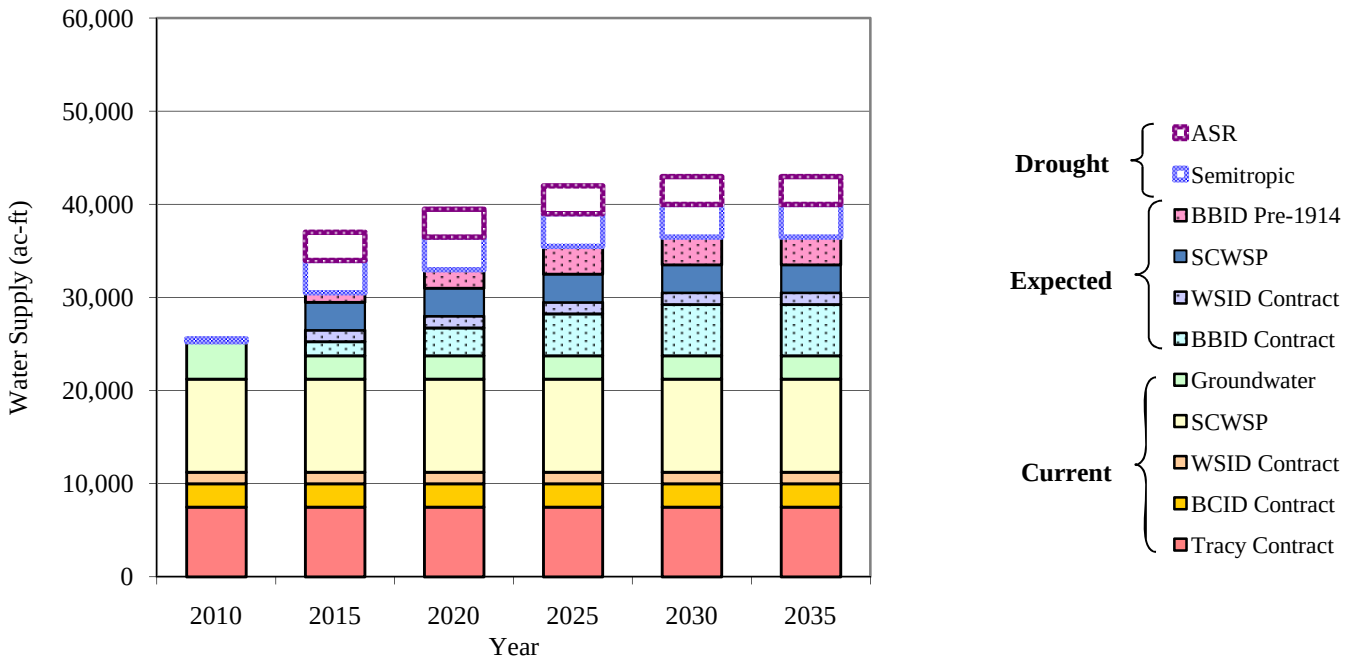


Table 18
Current and Projected Water Supply Allocations - Normal Year
City of Tracy, California

Abbreviations:
ac-ft/yr = Acre-feet per year
Ag = Agricultural
ASR = Aquifer storage and recovery
BCID = Banta-Carbona Irrigation District
BBID = Byron-Bethany Irrigation District
DMC/CVP = Central Valley Project water transported via the Delta Mendota Canal
M&I = Municipal and Industrial
Over/Approp. = Overlying and appropriative water rights
Pre-1914 = Water rights established prior to 1914 (the most senior water rights)
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Notes:
(a) Current water supply sources are contracts or water rights currently held by the City. Expected water supply sources are contracts that the City anticipates will be in place by the indicated year. For a complete description of each water source and contract, see Sections 4 and 5 of text.
(b) Reliability factors have been applied to the water quantities shown in Table 12. These factors are based on the average supply allocations for municipal and industrial ("M&I") and agricultural ("Ag") reliability contracts south of the Delta during normal and wet year periods as discussed in Section 5.
(c) Information regarding the expected quantity of water received in future years was provided by the Deputy Director of Public Works, Steve Bayley, and current USBR and SCWSP contracts.
(d) Subtotals may not add exactly due to rounding.
(e) Though the City can sustainably extract up to 9,000 ac-ft/yr of groundwater as discussed in Section 4, Tracy is planning to scale back its groundwater extraction in future years to increase the overall quality of its water supply. Tracy will continue to rely on groundwater for peaking and drought and emergency supplies, among other things, up to 9,000 ac-ft per year, on an as needed basis.
(f) If the City were to secure 10,500 ac-ft of storage in the Semitropic water bank, Tracy would be provided with up to 3,500 ac-ft of water annually. If Tracy were to use water from the Semitropic water bank in any given year, it would work to manage its supplies during subsequent years such that it could “refill” its water bank for future use (see Section 4.4.4 of text).
(g) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought.

Table 19
Current and Projected Water Supply Allocations - Single-Dry Year
City of Tracy, California

	Water Source (a)	Water Right/Contract	Reliability Factor (b)	Estimated Supply Allocation (ac-ft/yr) (c) (d) 2010	2015	2020	2025	2030	2035
No Water Banking	Current Supplies								
	DMC/CVP	USBR Tracy Contract-M&I Reliability	65%	6,500	6,500	6,500	6,500	6,500	6,500
	DMC/CVP	USBR BCID Contract-Ag Reliability	15%	750	750	750	750	750	750
	DMC/CVP	USBR WSID Contract-Ag Reliability	15%	375	375	375	375	375	375
	SCWSP	Pre-1914 Rights	95%	9,500	9,500	9,500	9,500	9,500	9,500
	Groundwater (e)	Over/Approp. Rights	100%	4,000	2,500	2,500	2,500	2,500	2,500
	Expected Supplies								
	DMC/CVP	USBR BBID Contract-Ag Reliability	15%	0	450	900	1,350	1,650	1,650
	DMC/CVP	USBR WSID Contract-Ag Reliability	15%	0	375	375	375	375	375
	Clifton Court Forebay	BBID Pre-1914 Rights	90%	0	900	1,800	2,700	2,700	2,700
	SCWSP	Pre-1914 Rights	95%	0	3,000	3,000	3,000	3,000	3,000
	Total Projected Available Supply			**21,125**	**24,350**	**25,700**	**27,050**	**27,350**	**27,350**
	% Cutback from Normal Year			**16%**	**20%**	**22%**	**24%**	**25%**	**25%**
Water Banking	Semitropic (f)	Water Banking	100%	333	3,500	3,500	3,500	3,500	3,500
	ASR	Water Banking	100%	0	3,000	3,000	3,000	3,000	3,000
	Total Projected Drought Supply (g)			**333**	**6,500**	**6,500**	**6,500**	**6,500**	**6,500**
	Total Projected Supply			**21,458**	**30,850**	**32,200**	**33,550**	**33,850**	**33,850**
	% Cutback from Normal Year			**16%**	**17%**	**18%**	**20%**	**21%**	**21%**

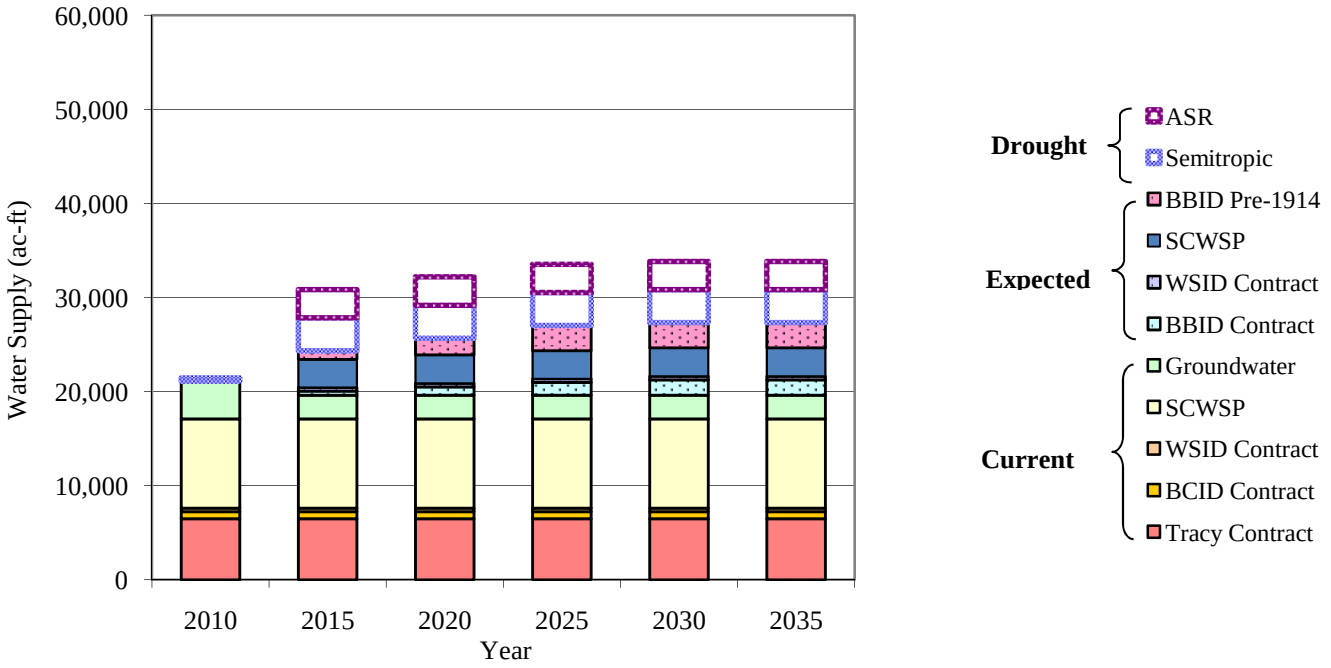

Table 19
Current and Projected Water Supply Allocations - Single-Dry Year
City of Tracy, California

Abbreviations:
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Notes:
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(b) Reliability factors have been applied to the water quantities shown in Table 12. These factors are based on the average supply allocations for municipal and industrial ("M&I") and agricultural ("Ag") reliability contracts south of the Delta during normal and wet year periods as discussed in Section 5.
(c) Information regarding the expected quantity of water received in future years was provided by the Deputy Director of Public Works, Steve Bayley, and current USBR and SCWSP contracts.
(d) Subtotals may not add exactly due to rounding.
(e) Though the City can sustainably extract up to 9,000 ac-ft/yr of groundwater as discussed in Section 4, Tracy is planning to scale back its groundwater extraction in future years to increase the overall quality of its water supply. Tracy will continue to rely on groundwater for peaking and drought and emergency supplies, among other things, up to 9,000 ac-ft per year, on an as needed basis.
(f) If the City were to secure 10,500 ac-ft of storage in the Semitropic water bank, Tracy would be provided with up to 3,500 ac-ft of water annually. If Tracy were to use water from the Semitropic water bank in any given year, it would work to manage its supplies during subsequent years such that it could “refill” its water bank for future use (see Section 4.4.4 of text).
(g) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought.

Table 20
Current and Projected Water Supply Allocations - Multiple-Dry Years 1, 2, and 3
City of Tracy, California

	Water Source (a)	Water Right/Contract	Reliability Factor (b)	Estimated Supply Allocation for Multiple Dry Years 1, 2, and 3 (ac-ft/yr) (c) (d)					
				2010	2015	2020	2025	2030	2035
No Water Banking	Current Supplies								
	DMC/CVP	USBR Tracy Contract-M&I Reliability	40%	4,000	4,000	4,000	4,000	4,000	4,000
	DMC/CVP	USBR BCID Contract-Ag Reliability	10%	500	500	500	500	500	500
	DMC/CVP	USBR WSID Contract-Ag Reliability	10%	250	250	250	250	250	250
	SCWSP	Pre-1914 Rights	95%	9,500	9,500	9,500	9,500	9,500	9,500
	Groundwater (e)	Over/Approp. Rights	100%	9,000	9,000	9,000	9,000	9,000	9,000
	Expected Supplies								
	DMC/CVP	USBR BBID Contract-Ag Reliability	10%	0	300	600	900	1,100	1,100
	DMC/CVP	USBR WSID Contract-Ag Reliability	10%	0	250	250	250	250	250
	Clifton Court Forebay	BBID Pre-1914 Rights	90%	0	900	1,800	2,700	2,700	2,700
	SCWSP	Pre-1914 Rights	95%	0	3,000	3,000	3,000	3,000	3,000
	Total Projected Available Supply for Multiple Dry Year 1, 2, and 3			**23,250**	**27,700**	**28,900**	**30,100**	**30,300**	**30,300**
	% Cutback from Normal Year for Multiple Dry Year 1, 2, and 3			**8%**	**9%**	**12%**	**15%**	**17%**	**17%**
Water Banking	Semitropic (f)	Water Banking	100%	333	3,500	3,500	3,500	3,500	3,500
	ASR	Water Banking	100%	0	3,000	3,000	3,000	3,000	3,000
	Total Projected Drought Supply (g)			**333**	**6,500**	**6,500**	**6,500**	**6,500**	**6,500**
Total Projected Supply for Multiple Dry Year 1, 2, and 3				**23,583**	**34,200**	**35,400**	**36,600**	**36,800**	**36,800**
% Cutback from Normal Year for Multiple Dry Year 1, 2, and 3				**8%**	**8%**	**10%**	**13%**	**14%**	**14%**

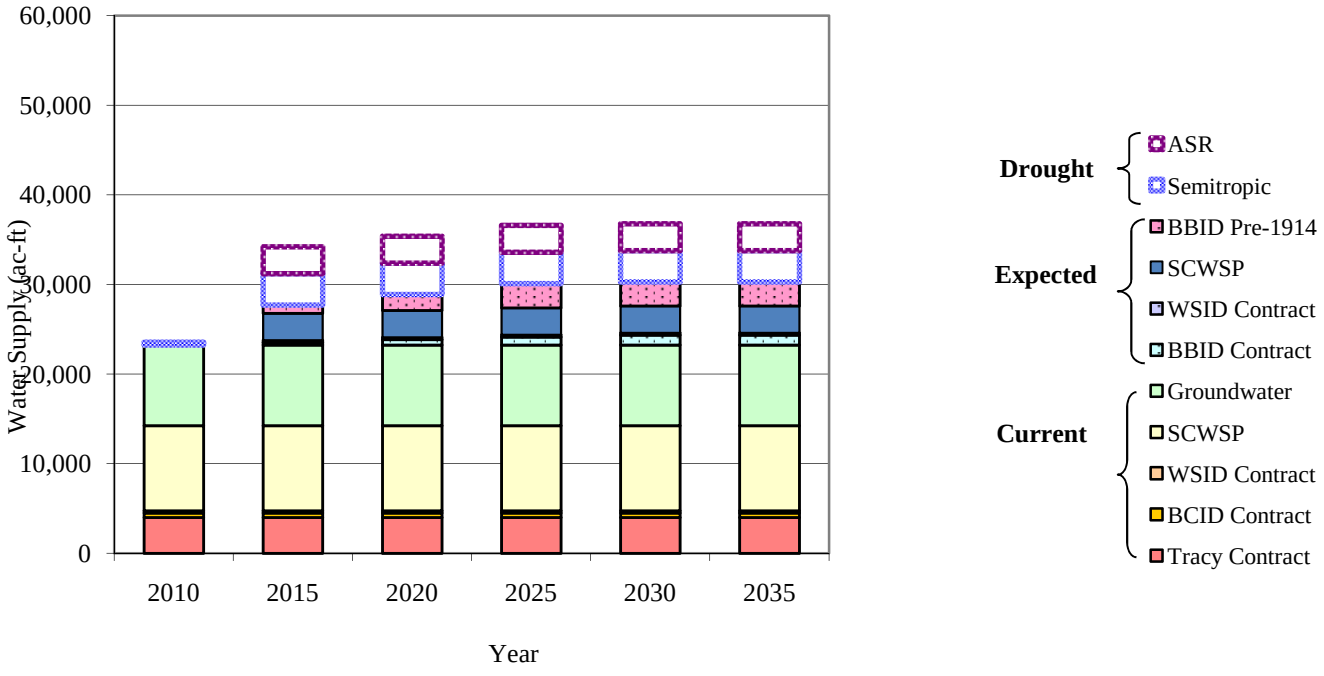

Table 20
Current and Projected Water Supply Allocations - Multiple-Dry Years 1, 2, and 3
City of Tracy, California

Abbreviations:
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(a) Current water supply sources are contracts or water rights currently held by the City. Expected water supply sources are contracts that the City anticipates will be in place by the indicated year. For a complete description of each water source and contract, see Sections 4 and 5 of text.
(b) Reliability factors have been applied to the water quantities shown in Table 12. These factors are based on the average supply allocations for municipal and industrial ("M&I") and agricultural ("Ag") reliability contracts south of the Delta during normal and wet year periods as discussed in Section 5.
(c) Information regarding the expected quantity of water received in future years was provided by the Deputy Director of Public Works, Steve Bayley, and current USBR and SCWSP contracts.
(d) Subtotals may not add exactly due to rounding.
(e) Though the City can sustainably extract up to 9,000 ac-ft/yr of groundwater as discussed in Section 4, Tracy is planning to scale back its groundwater extraction in future years to increase the overall quality of its water supply. Tracy will continue to rely on groundwater for peaking and drought and emergency supplies, among other things, up to 9,000 ac-ft per year, on an as needed basis.
(f) If the City were to secure 10,500 ac-ft of storage in the Semitropic water bank, Tracy would be provided with up to 3,500 ac-ft of water annually. If Tracy were to use water from the Semitropic water bank in any given year, it would work to manage its supplies during subsequent years such that it could “refill” its water bank for future use (see Section 4.4.4 of text).
(g) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought.

Table 21
Water Conservation and Rationing Plan - Stages of Action (a)
City of Tracy, California

Stage	% Reduction (b)	Reduction Method (c) (d)	
Stage I	< 10%	Voluntary	
		• Flagrant water waste or excessive runoff	Prohibited
		• Maintenance of plumbing and irrigation systems	Mandated
		• Prudent water conservation measures:	
		Hand-held trigger handle sprayers	Encouraged
		Drought tolerant landscape	Encouraged
		Watering during windy periods	Discouraged
		• Pool covers	Mandated
Stage II	10%	Mandatory: Landscape irrigation and outdoor water use	
		• Landscape irrigation prohibited unless:	
		7pm-9am May to September or 4pm-10am October to April	Accepted
		Person is present outdoors and in view of irrigated area	Accepted
		A drip or bubbler system is used	Accepted
		• Non-commercial sidewalk washing	Prohibited
		• Commercial sidewalk washing	Discouraged
		• Addition of water above health and operational requirements for pools and hot tubs	Prohibited
		• Car washing (except with trigger spray)	Prohibited
Stage III	15%	Mandatory	
		• Landscape irrigation prohibited unless:	
		May-September:	
		Odd addresses Mon, Wed, Sat 7pm-9am,	Accepted
		Even addresses Tue, Thur, Sun 7pm-9am	Accepted
		October-April:	
		Odd addresses Mon, Wed, Sat 4pm-10am	Accepted
		Even addresses Tue, Thur, Sun 4pm-10am	Accepted
		• Landscape irrigation during high wind	Prohibited
		• Commercial sidewalk washing, except on Friday	Prohibited
		• Restaurants may serve water only upon request	Mandated
		• Manager/Owners of commercial lodgings must post notice of drought conditions in every guest room	Mandated
Stage IV	25%	Mandatory: Reduction based on base year usage	
		• Car washing (except with bucket)	Prohibited
		• Auto dealerships may wash vehicles with trigger nozzle only on Friday or on the day before or day of delivery	Mandated
		• Car washing with recycled water facility not restricted	Accepted
		• Manager/Owner of every facility with restroom must post notice declaring drought condition	Mandated
Stage V	>25%	Mandatory: Emergency reductions (e)	
		• Water use other than required for public health and safety and fire protection	Prohibited
		• Landscape irrigation	Prohibited
		• Recreational water use	Prohibited

Notes:
(a) Stages of action and reduction methods are summarized from Tracy's Water Conservation and Rationing Plan ("WCRP"), Municipal Code Section 11.28.170-290, based on the City's Water Shortage Contingency Plan (Kennedy/Jenks, 1994).
(b) Percent reduction refers to City-wide potable water demand reduction goals.
(c) Excess water surcharge/rate structure may be adopted during times of drought or water emergency by resolution of the City Council.
(d) Although prohibition of street cleaning with potable water is not specifically included in the WCRP, it is not standard practice by the City.
(e) Emergency supply reductions may be caused by the inability to draw groundwater, contamination, natural disaster, floods, sabotage, or any other unusual circumstance that affects the quality or reliability of the City's water supply.

Table 22
Current and Projected Potable Water Supply vs. Demand
Normal Year
City of Tracy, California

	Water Supply and Demand	Estimated Potable Water Supply and Demand (ac-ft/yr) (a)					
		2010	2015	2020	2025	2030	2035
No Water Banking	Projected Available Supply (b)	25,300	30,500	33,000	35,500	36,500	36,500
	Total Potable Water Demand (c)	17,900	23,000	25,000	28,300	31,000	33,600
	Difference	***7,350***	***7,500***	***8,000***	***7,200***	***5,500***	***2,900***
	Percent Cutback	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***
Water Banking	Projected Available Supply	25,300	30,500	33,000	35,500	36,500	36,500
	Projected Drought Supply (d)	333	6,500	6,500	6,500	6,500	6,500
	Subtotal Potable Water Supply	25,600	37,000	39,500	42,000	43,000	43,000
	Total Potable Water Demand (c)	17,900	23,000	25,000	28,300	31,000	33,600
	Difference	***7,680***	***14,000***	***14,500***	***13,700***	***12,000***	***9,400***
	Percent Cutback	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***

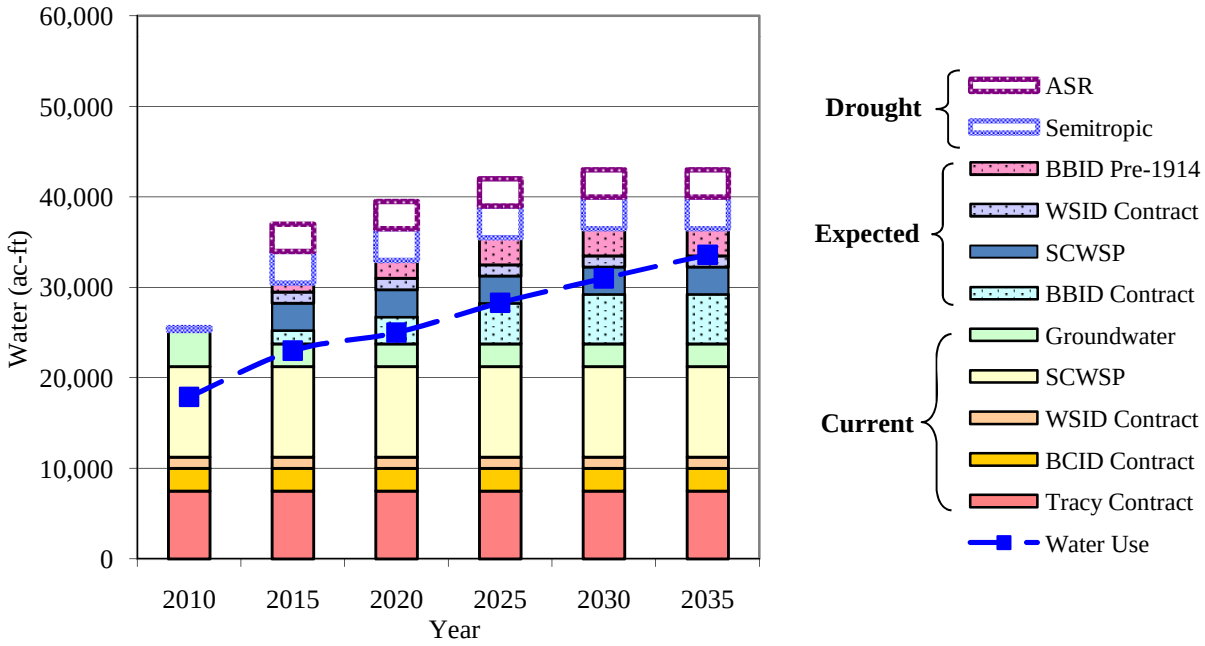


Table 22
Current and Projected Potable Water Supply vs. Demand
Normal Year

City of Tracy, California

Abbreviations:

ac-ft/yr = Acre-feet per year
ASR = Aquifer storage and recovery
BCID = Banta-Carbona Irrigation District
BBID = Byron-Bethany Irrigation District
DMC/CVP = Central Valley Project water transported via the Delta Mendota Canal
Over/Approp. = Overlying and appropriative water rights
Pre-1914 = Water rights established prior to 1914 (the most senior water rights)
SCWSP = South County Water Supply Project
USBR = United States Bureau of Reclamation
WSID = West Side Irrigation District

Notes:

(a) Subtotals may not add exactly due to rounding.
(b) Projected available supplies include both current and expected supplies described in Table 12.
(c) Total potable water demand is described in Tables 6 and 8.
(d) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought.

Table 23
Current and Projected Potable Water Supply vs. Demand
Single-Dry Year
City of Tracy, California

	Water Supply and Demand	Estimated Potable Water Supply and Demand (ac-ft/yr) (a)					
		2010	2015	2020	2025	2030	2035
No Water Banking	Projected Available Supply (b)	21,100	24,400	25,700	27,100	27,400	27,400
	Total Potable Water Demand (c)	17,900	23,000	25,000	28,300	31,000	33,600
	Difference	***3,230***	***1,350***	***700***	***-1,300***	***-3,700***	***-6,300***
	Percent Cutback	***0%***	***0%***	***0%***	***-4%***	***-13%***	***-23%***
Water Banking	Projected Available Supply	21,100	24,400	25,700	27,100	27,400	27,400
	Projected Drought Supply (d)	333	6,500	6,500	6,500	6,500	6,500
	Subtotal Potable Water Supply	21,500	30,900	32,200	33,600	33,900	33,900
	Total Potable Water Demand (c)	17,900	23,000	25,000	28,300	31,000	33,600
	Difference	***3,560***	***7,850***	***7,200***	***5,250***	***2,850***	***250***
	Percent Cutback	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***

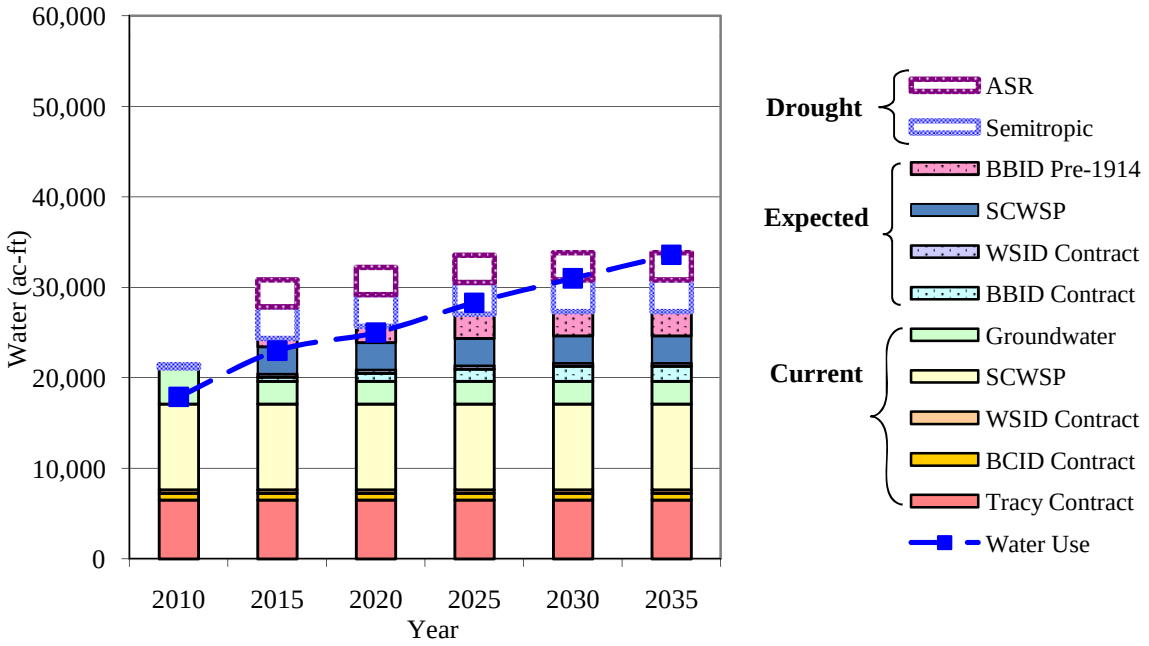


Table 23
Current and Projected Potable Water Supply vs. Demand
Single-Dry Year

City of Tracy, California

Abbreviations:

ac-ft/yr = Acre-feet per year
ASR = Aquifer storage and recovery
BCID = Banta-Carbona Irrigation District
BBID = Byron-Bethany Irrigation District
DMC/CVP = Central Valley Project water transported via the Delta Mendota Canal
Over/Approp. = Overlying and appropriative water rights
Pre-1914 = Water rights established prior to 1914 (the most senior water rights)
SCWSP = South County Water Supply Project
USBR = United States Bureau of Reclamation
WSID = West Side Irrigation District

Notes:

(a) Subtotals may not add exactly due to rounding.
(b) Projected available supplies include both current and expected supplies described in Table 12.
(c) Total potable water demand is described in Tables 6 and 8.
(d) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought.

Table 24
Current and Projected Potable Water Supply vs. Demand
Multiple-Dry Year
City of Tracy, California

Multiple Dry Year		Water Supply and Demand	Estimated Potable Water Supply and Demand (ac-ft/yr) (a)					
			2010	2015	2020	2025	2030	2035
Without Water Banking	Year 1	Projected Available Supply (b)	23,300	27,700	28,900	30,100	30,300	30,300
		Total Potable Water Demand (c)	17,900	23,000	25,000	28,300	31,000	33,600
		Difference	***5,350***	***4,700***	***3,900***	***1,800***	***-700***	***-3,300***
		Percent Cutback	***0%***	***0%***	***0%***	***0%***	***-2%***	***-11%***
	Year 2	Projected Available Supply (b)	23,300	27,700	28,900	30,100	30,300	30,300
		Total Potable Water Demand (c)	18,920	23,400	25,660	28,840	31,520	34,136
		Difference	***4,330***	***4,300***	***3,240***	***1,260***	***-1,200***	***-3,800***
		Percent Cutback	***0%***	***0%***	***0%***	***0%***	***-4%***	***-13%***
	Year 3	Projected Available Supply (b)	23,300	27,700	28,900	30,100	30,300	30,300
		Total Potable Water Demand (c)	20,960	23,800	26,320	29,380	32,040	34,672
		Difference	***2,290***	***3,900***	***2,580***	***720***	***-1,700***	***-4,400***
		Percent Cutback	***0%***	***0%***	***0%***	***0%***	***-6%***	***-14%***
With Water Banking	Year 1	Projected Available Supply	23,300	27,700	28,900	30,100	30,300	30,300
		Projected Drought Supply (d)	333	6,500	6,500	6,500	6,500	6,500
		Subtotal Potable Water Supply	23,600	34,200	35,400	36,600	36,800	36,800
		Total Potable Water Demand (c)	17,900	23,000	25,000	28,300	31,000	33,600
		Difference	***5,680***	***11,200***	***10,400***	***8,300***	***5,800***	***3,200***
		Percent Cutback	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***
	Year 2	Projected Available Supply	23,300	27,700	28,900	30,100	30,300	30,300
		Projected Drought Supply (d)	333	6,500	6,500	6,500	6,500	6,500
		Subtotal Potable Water Supply	23,600	34,200	35,400	36,600	36,800	36,800
		Total Potable Water Demand (c)	18,920	23,400	25,660	28,840	31,520	34,136
		Difference	***4,660***	***10,800***	***9,740***	***7,760***	***5,280***	***2,660***
		Percent Cutback	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***
	Year 3	Projected Available Supply	23,300	27,700	28,900	30,100	30,300	30,300
		Projected Drought Supply (d)	333	6,500	6,500	6,500	6,500	6,500
		Subtotal Potable Water Supply	23,600	34,200	35,400	36,600	36,800	36,800
		Total Potable Water Demand (c)	20,960	23,800	26,320	29,380	32,040	34,672
		Difference	***2,620***	***10,400***	***9,080***	***7,220***	***4,760***	***2,130***
		Percent Cutback	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***

Abbreviations:
ac-ft/yr = Acre-feet per year
ASR = Aquifer storage and recovery
BCID = Banta-Carbona Irrigation District
BBID = Byron-Bethany Irrigation District
DMC/CVP = Central Valley Project water transported via the Delta Mendota Canal
Over/Approp. = Overlying and appropriative water rights
Pre-1914 = Water rights established prior to 1914 (the most senior water rights)
SCWSP = South County Water Supply Project
USBR = United States Bureau of Reclamation
WSID = West Side Irrigation District

Table 24
Current and Projected Potable Water Supply vs. Demand
Multiple-Dry Year
City of Tracy, California

Notes:

(a) Subtotals may not add exactly due to rounding.
(b) Projected available supplies include both current and expected supplies described in Table 12.
(c) Total potable water demand is described in Tables 8. Year 2 and Year 3 water demand is assumed to grow linearly.
(d) The City is currently working to secure the indicated "Drought" water supplies. These supplies would be used to supplement less reliable sources during emergency situations or in times of drought.

Table 25
Water Conservation Activities
City of Tracy, California

Water Conservation Action	Water Conservation Actions and Expenditures (a) (b)				
	2005-06	2006-07	2007-08	2008-09	2009-10
Residential Water Audits (BMP 1)					
Cost	--	--	--	$12,321	$12,937
Retrofit Kits (BMP 2)					
Retrofit Kit Costs	--	--	$160	$80	$80
Washing Machine Rebates (BMP 6)					
Allocated Budget	$10,000	$10,000	$10,000	$10,000	$10,000
Number of Rebates Given	200	200	200	201	200
Cost of Rebates Given	$10,000	$10,000	$10,000	$10,050	$10,000
Public Information (BMP 7)					
Public Information Cost	--	--	$500	$2,200	$2,500
School Education (BMP 8)					
Education Program Cost	--	--	--	$500	$500
Conservation Coordinator (BMP 12)					
Cost	--	--	$36,244	$38,056	$39,959
ULFT Replacement (BMP 14)					
Allocated Budget	--	--	$10,000	$10,000	$10,000
Number of Rebates Given	--	--	18	63	41
Cost of Rebates Given	--	--	$3,508	$8,875	$7,472

Abbreviations:
-- = Data not available or not applicable
BMP = Best Management Practice
FY = Fiscal Year
ULFT = Ultra low flow toilet

Notes:
(a) Values are reported for fiscal years ("FY") 2005-06 through 2009-10.
(b) Water conservation actions and expenditures are based on data from Water Resources Coordinator, Stephanie Reyna-Hiestand provided by email and personal communication.

Table 26
Monthly Service Charges and Seasonal Water Rates
City of Tracy, California

Meter Size	Monthly Charge (a)
5/8" and 3/4"	$11.70
1"	$20.40
1.5"	$46.65
2"	$82.75
3"	$186.25
4"	$331.25
6"	$745.25
8"	$1,325.05
10"	$2,070.40

Block Number	Winter Block Units (b)	Summer Block Units (c)	Block Rates (d)
Block 1	0-12 units	0-18 units	$1.00
Block 2	13-19 units	19-29 units	$1.45
Block 3	20-191 units	30-287 units	$1.65
Block 4	over 191 units	over 288 units	$1.80

Abbreviations:
" = inches

Notes:
(a) Water service charges are from the City of Tracy Website accessed 3 January 2011.
(b) Winter block units are effective November through April.
(c) Summer block units are effective May through October.
(d) Prices are per 100 cubic feet of water.

Table 27
Implementation of Demand Management Measures
City of Tracy, California

No.	DMM	Implementation Date (a)	Completion Date (a)	Percent Complete as of March 2011 (a)	Budget Amount (a)	Budget Source (a)
1	Water survey programs for single-family residential and multifamily residential customers	1/1/2011	12/31/2011	50%	$0	Included in BMP 12
2	Residential plumbing retrofit	1/1/2011	12/31/2011	50%	$10,000	City's water revenue fund
3	System water audits, leak detection, and repair	1/1/2011	12/31/2011	50%	$10,000	City's water revenue fund
4	Metering with commodity rates for all new connections and retrofit of existing connections	1/1/2011	12/31/2011	100%	$0	--
5	Large landscape conservation programs and incentives (b)	1/1/2011	12/31/2011	75%	$100,000	Grant
6	High-efficiency washing machine rebate programs	1/1/2011	12/31/2011	50%	$10,000	City's water revenue fund
7	Public information programs (b)	1/1/2011	12/31/2011	90%	$25,000	Grant/City's water revenue fund
8	School education programs	1/1/2011	12/31/2011	90%	$5,000	City's water revenue fund
9	Conservation programs for commercial, industrial, and institutional accounts (b)	1/1/2011	12/31/2011	25%	$500,000	Grant
10	Wholesale agency programs	Not applicable				
11	Conservation pricing	1/1/2011	12/31/2011	100%	$0	Included in BMP 12
12	Water conservation coordinator	1/1/2011	12/31/2011	100%	$122,580	City's water revenue fund
13	Water waste prohibition	1/1/2011	12/31/2011	90%	$0	Included in BMP 12
14	Residential ultra-low-flush toilet replacement programs	1/1/2011	12/31/2011	50%	$10,000	City's water revenue fund

Abbreviations:
DMM = Demand Management Measures
CUWCC = California Urban Water Conservation Council
No. = Number

Notes:
(a) All information provided by City on 3 March 2011.
(b) Completion of BMP at CUWCC coverage level is contingent on receiving recycled water grant.

Legend

Freeways and Highways

Erler & Kalinowski, Inc.

Regional Location

N

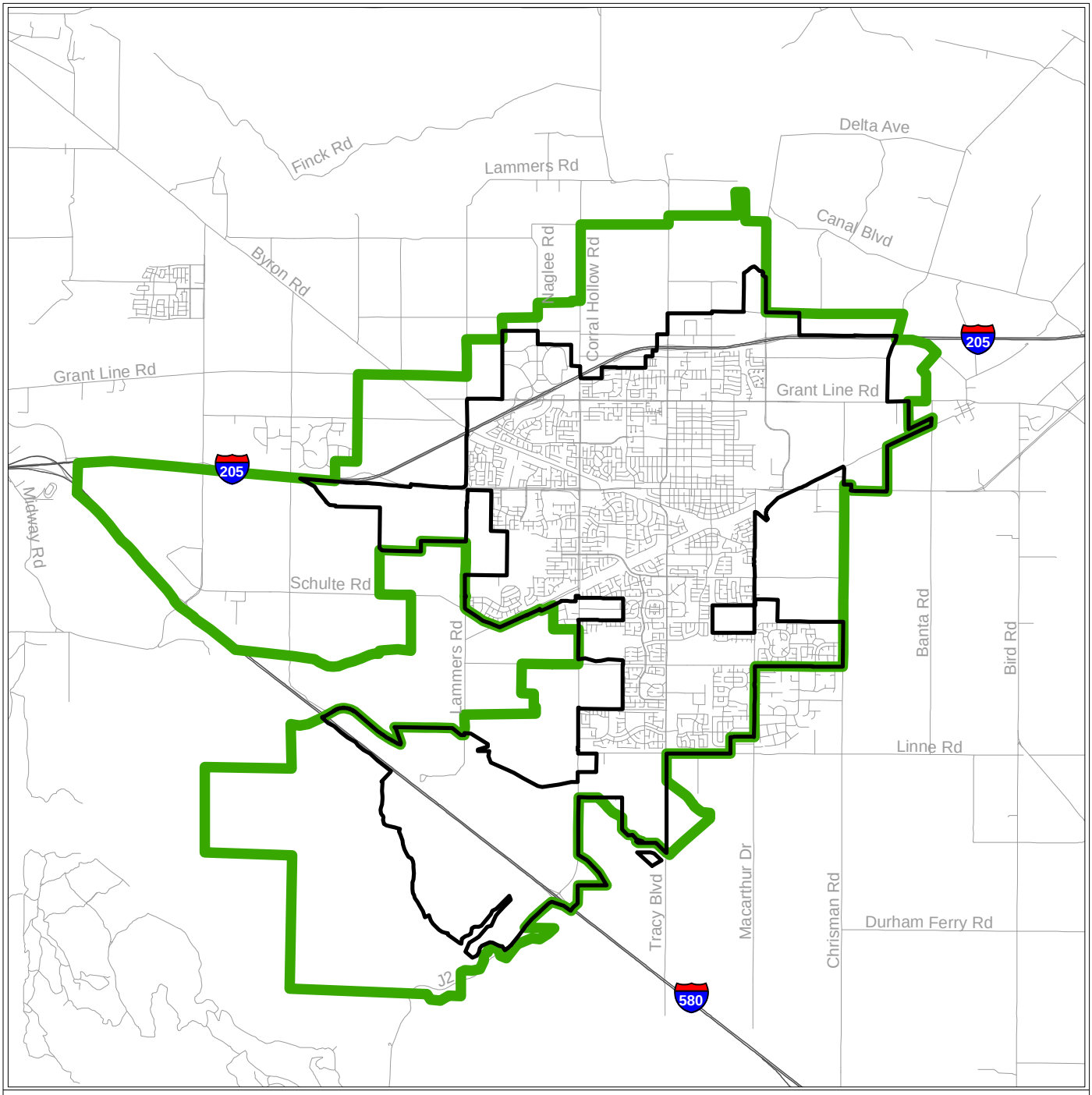
0 20 40

(Approximate Scale in Miles)

City of Tracy
Tracy, CA
May 2011
EKI B00043.00

Figure 1

X:\Site Location Map\Figure __ - Site Location.mxd



Legend

- City Limit
- Sphere of Influence
- Streets and Highways

Notes

1. All locations are approximate.
2. Sphere of influence based on April 2009 Draft General Plan Ammendment.

Sources

From City Staff, November 2010.

N

0 9,000 18,000

(Approximate Scale in Feet)

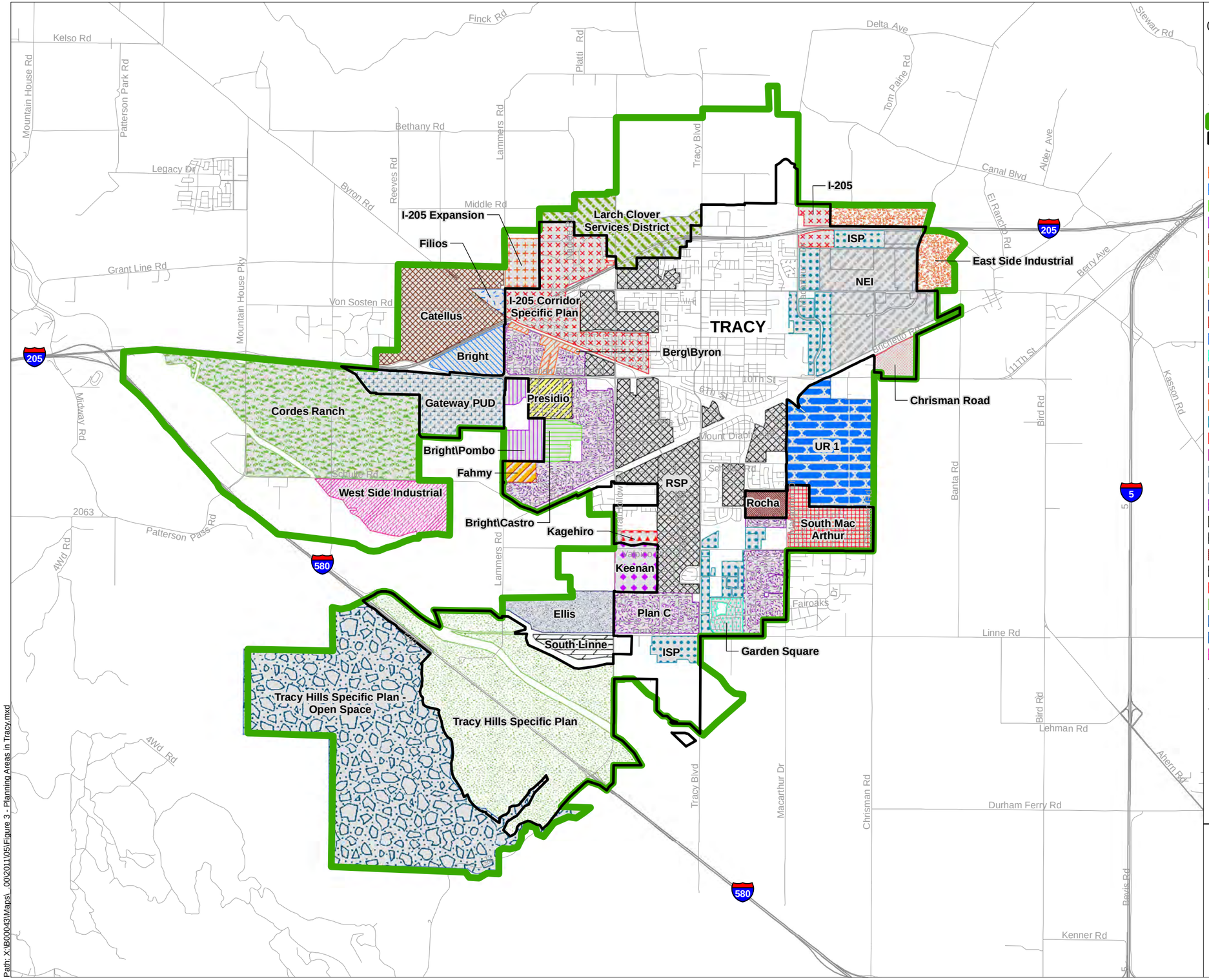
Erler & Kalinowski, Inc.

Tracy City Limits and Sphere of Influence

City of Tracy
Tracy, CA
May 2011
EKI B00043.00

Figure 2

Path: X:\B00043\Maps_00\2011\05\Figure 2 - SOI.mxd



0 6,000 12,000

(Approximate Scale in Feet)

N

Legend

- Streets and Highways
- Sphere of Influence
- City Limit

Planning Areas

- Berg\Byron
- Bright
- Bright\Castro
- Bright\Pombo
- Catellus
- Chrisman Road
- Cordes Ranch
- East Side Industrial
- Ellis
- Fahmy
- Filios
- Garden Square
- Gateway PUD
- I-205 Corridor Specific Plan
- I-205 Expansion
- Industrial Areas Specific Plan ("ISP")
- Kagehiro
- Keenan
- Larch Clover
- Northeast Industrial PUD ("NEI")
- Plan C
- Presidio
- Residential Area Specific Plan ("RSP")
- Rocha
- South Linne
- South Mac Arthur
- Tracy Hills Specific Plan
- Tracy Hills Specific Plan - Open Space
- UR 1
- West Side Industrial

Notes

1. All Locations are approximate.

Sources

From City Staff, November 2010.

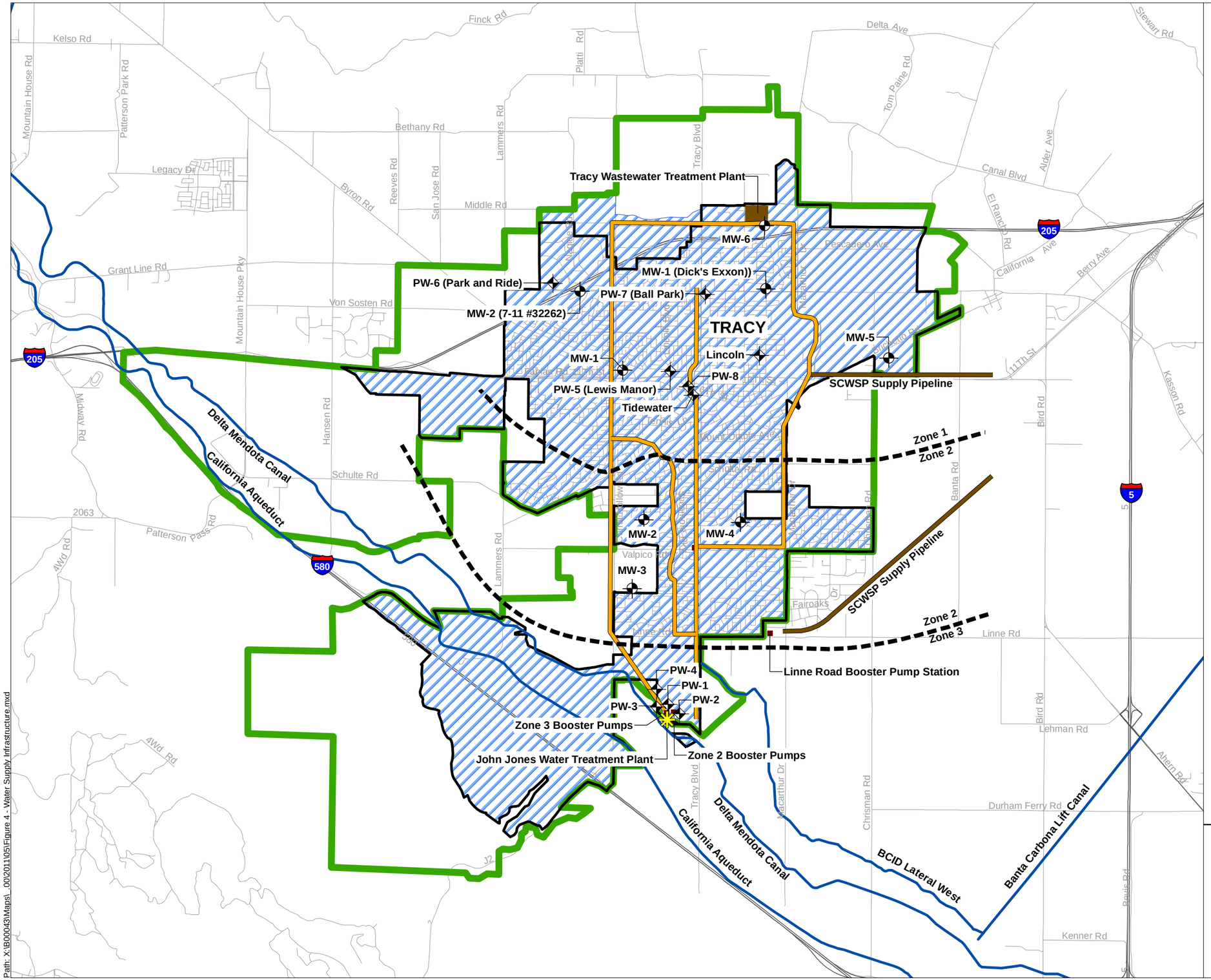
Erler & Kalinowski, Inc.

Planning Areas in Tracy

City of Tracy
Tracy, CA
May 2011
EKI B00043.00

Figure 3

Path: X:\B00043\Maps\ 00\2011\05\Figure 3 - Planning Areas in Tracy.mxd



N

0 6,000 12,000

(Approximate Scale in Feet)

Legend

- Extraction Well
- Monitoring Well
- Booster Pump Station
- John Jones Water Treatment Plant
- City Limit
- Sphere of Influence
- Wastewater Treatment Plant
- Water Service Area Boundary
- Existing Distribution Mains
- SCWSP Supply Pipeline/Transmission Main
- Pressure Zone Line
- Streets and Highways
- Canal

Abbreviations

MW	=	Monitoring Well
PW	=	Extraction (Pumping) Well
SCWSP	=	South County Water Supply Project

Notes

1. All Locations are approximate.
2. Figure adapted from figure provided by GEI Consultants.
3. Service area boundary is the same from the baseline period through current.

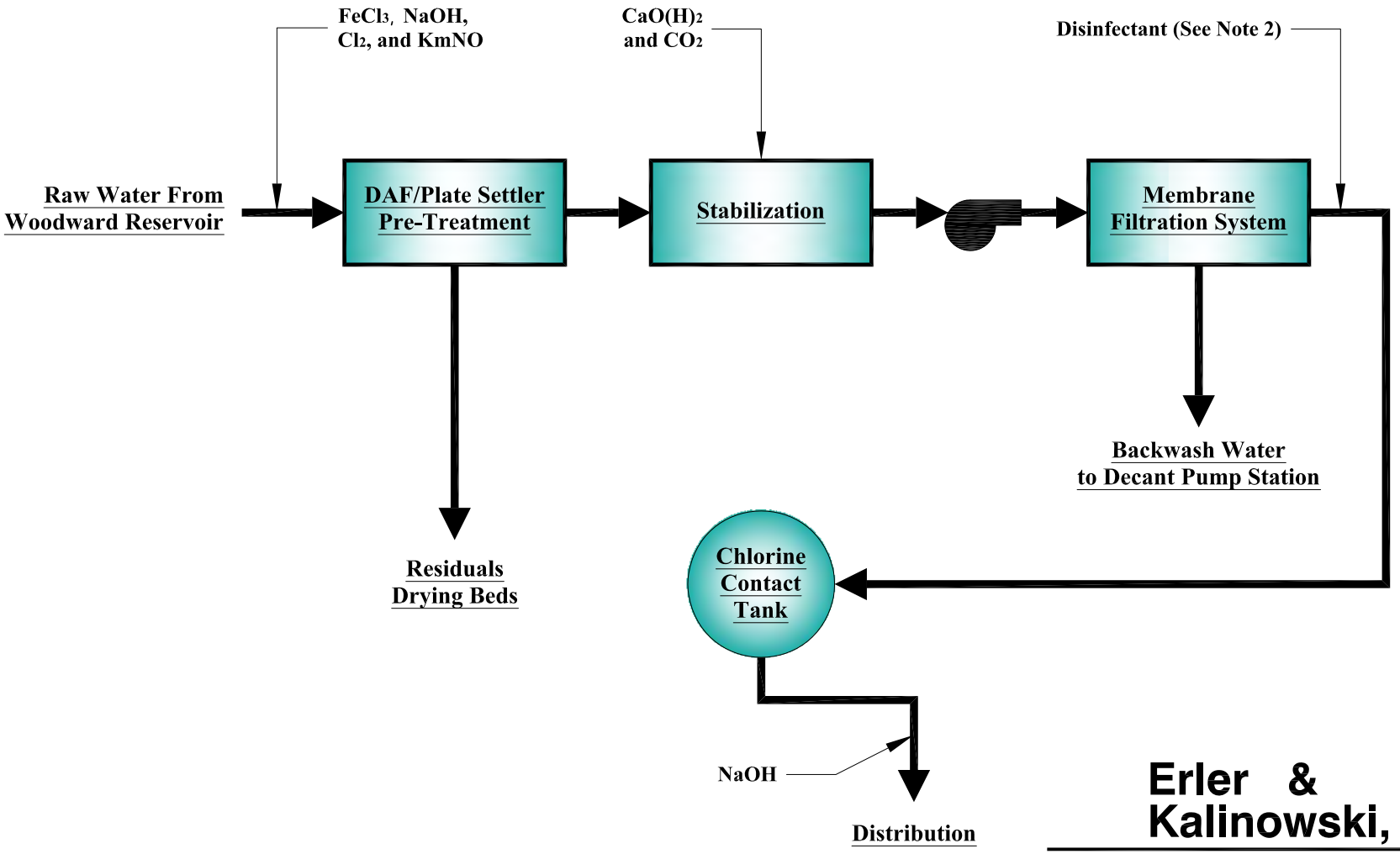
Erler & Kalinowski, Inc.

Water Supply Infrastructure

City of Tracy
Tracy, CA
May 2011
EKI B00043.00

Figure 4

Path: X:\B00043\Maps\...00\2011\05\Figure 4 - Water Supply Infrastructure.mxd



Notes:

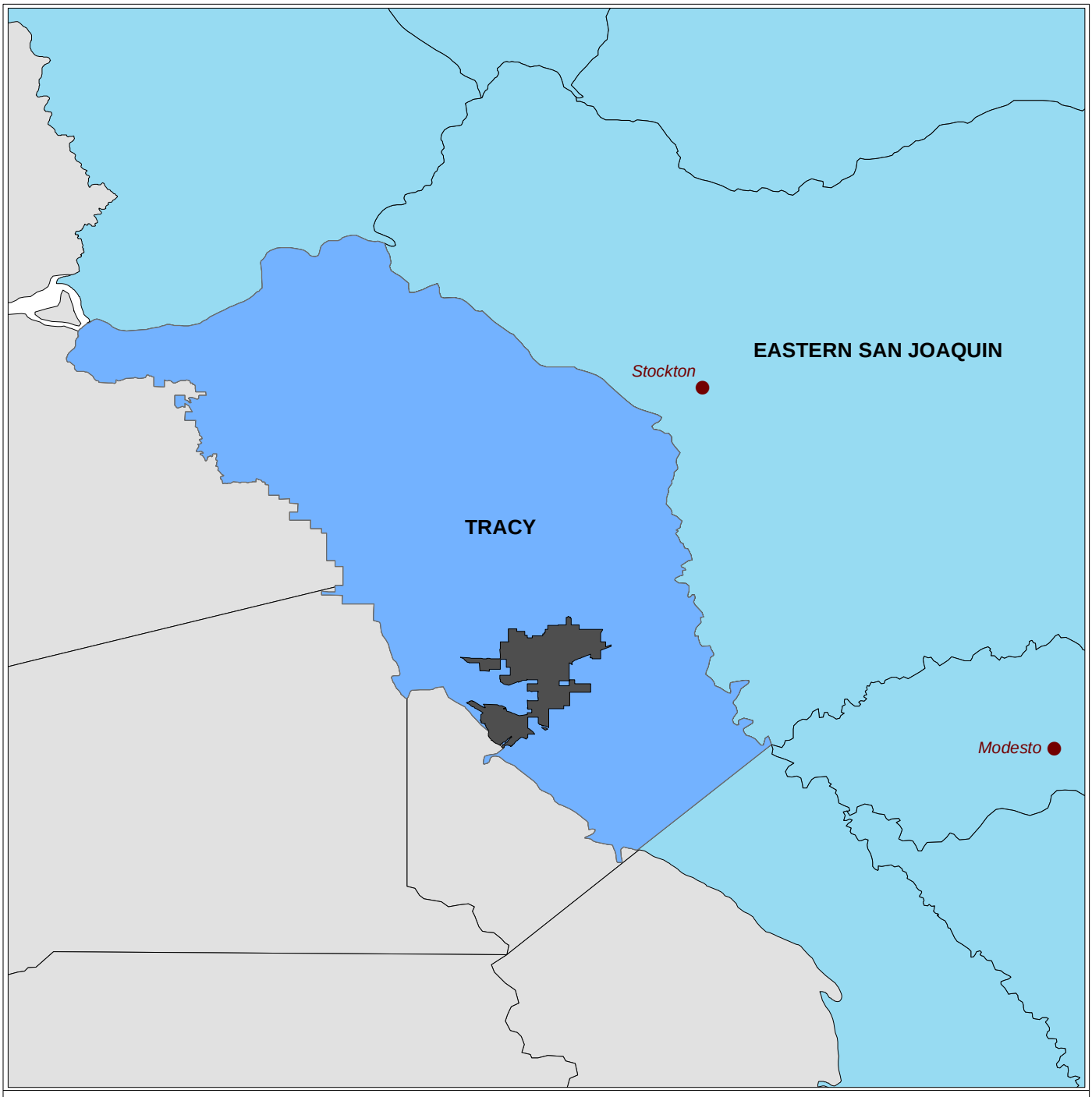
1. Figure adapted from Black & Veatch, 2002.
2. Chlorine or chloramines are added depending on operating parameters.

Erler & Kalinowski, Inc.

Process Schematic of
Nick C. DeGroot Water Treatment Plant

City of Tracy
Tracy, CA
May 2011
EKI B00043.00
Figure 5

20110602.09273808 G:\B00043.00\05-2011\Figure 5 - Process-schematic.dwg Model



Legend

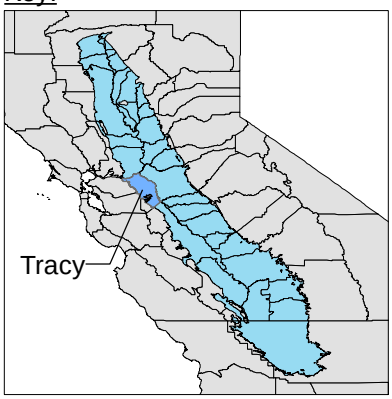
- Tracy Sub-Basin
- San Joaquin/Sacramento Groundwater Basin
- City of Tracy

N

0 9 18

(Approximate Scale in Miles)

Key:

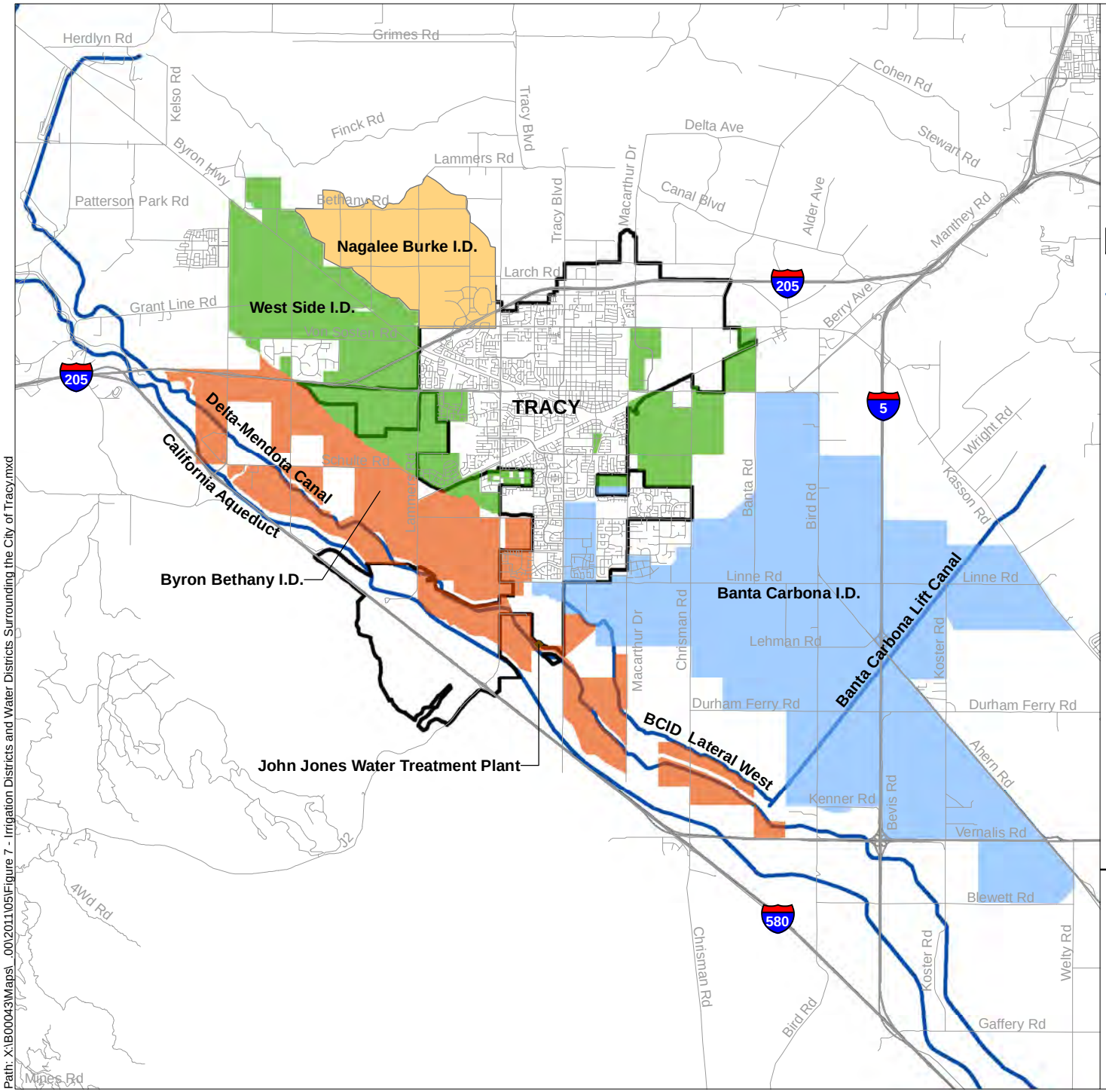


Erler & Kalinowski, Inc.

Tracy Sub-Basin

City of Tracy
Tracy, CA
May 2011
EKI B00043.00
Figure 6

Path: X:\B00043\Maps_00\2011\05\Figure 6 - Tracy Sub-Basin.mxd



N

0 12,000 24,000

(Approximate Scale in Feet)

Legend

- City Limit
- Streets and Highways
- Canal

Notes

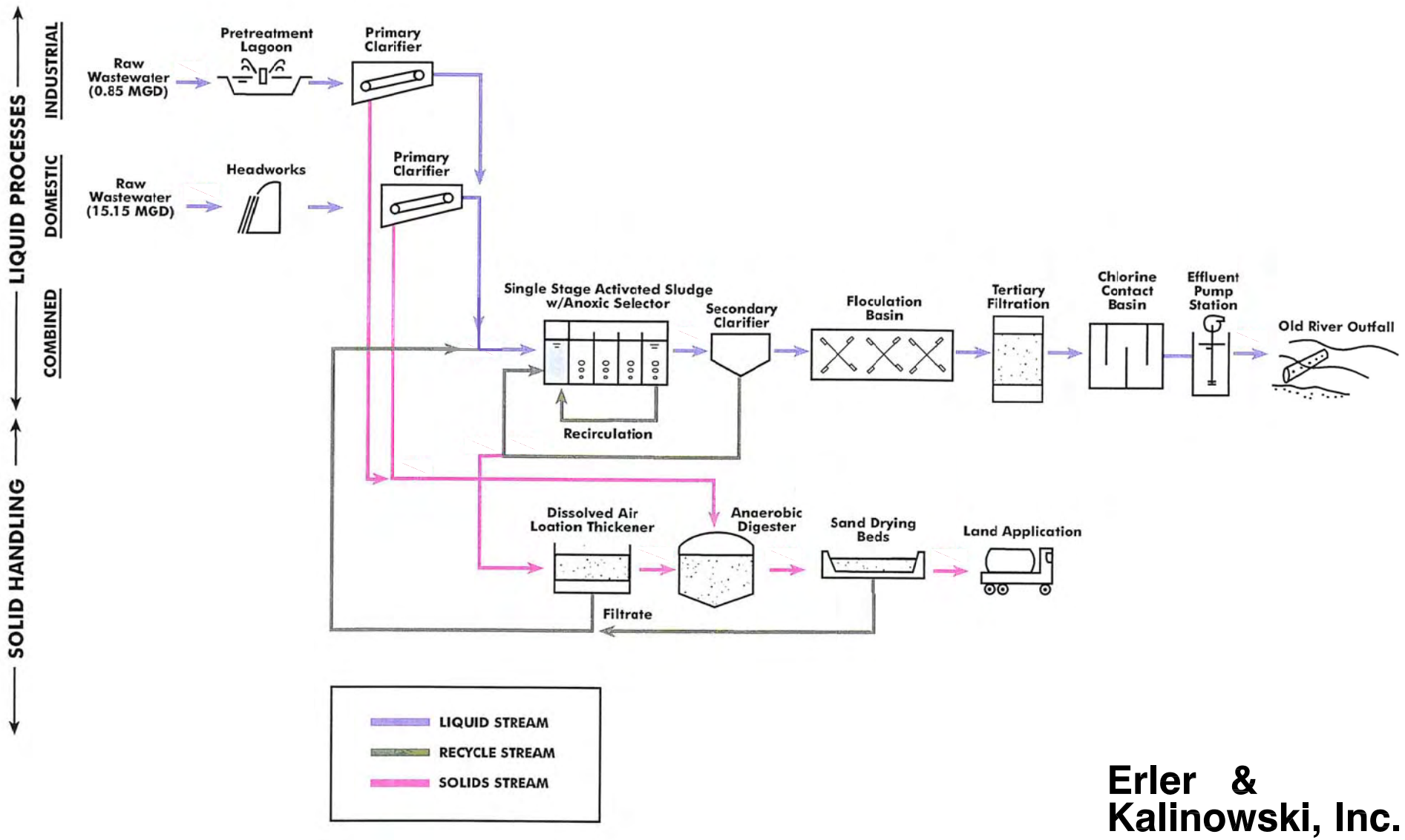
1. All locations are approximate.
2. Irrigation district boundary source: California Department of Water Resources.

Erler & Kalinowski, Inc.

Irrigation Districts and Water Districts Surrounding the City of Tracy

City of Tracy
Tracy, CA
May 2011
EKI B00043.00
Figure 7

Path: X:\B00043\Maps_00\2011\05\Figure 7 - Irrigation Districts and Water Districts Surrounding the City of Tracy.mxd



Erler & Kalinowski, Inc.

Wastewater Treatment Plant
Flow Diagram

City of Tracy
Tracy, CA
May 2011
EKI B00043.00
Figure 8

Notes:

1. Source: *Figure 5-17.fh10, City of Tracy Facilities* by CH2MHILL January 2003.